

Message from the Vice Presidents



Eastern Section Vice President
Sujana S. Chandrasekhar, MD FACS



Middle Section Vice President
Bruce J. Gantz, MD FACS



Southern Section Vice President
M. Boyd Gillespie, MD MSc FACS



Western Section Vice President
Peter A. Weisskopf, MD FACS

Welcome to Coronado and our Triological Combined Sections Meeting. It has been a pleasure to serve the membership as the Section Vice Presidents and we are very proud of the outstanding program that has been assembled by our fellow Vice President and Program Chair, Dr. Sujana Chandrasekhar along with our outstanding Program Committee members. There are several new and exciting sessions and events as well as our tried and true ones that you don't want to miss this year. Top off your first day of sessions by joining us for our Vice President's Welcome Reception on Thursday evening. Close out the meeting on Saturday night with your toes in the sand at our Beach Bash. The first-ever Women in Otolaryngology Reception is taking place on Friday following the Resident Bowl, where we have a record number of teams competing. Additional activities include the Peer Review Seminar, Thesis Seminar, Annual Golf Outing, and the Neely Physician/Scientist Meeting. The Speed Networking session on Saturday is a special opportunity to

ask questions and be mentored by some of the most prominent leaders in otolaryngology in a fun and relaxed setting. We encourage you to take time to network and engage during the breakfasts, lunches and receptions provided. And, as always, we ask that you please visit with the exhibitors who help support our meeting. In addition to their booths, kiosks are available to view their products and services and even set up one on one meetings while you are here in Coronado.

For those of you who are not Triological Society members or Fellows, we welcome the opportunity to answer your questions regarding how you can become part of this Noble organization. The Society awards \$600,000 per year in support of research efforts of otolaryngologist-head and neck surgeons, disseminates the latest basic science and clinical information in the Laryngoscope, and our Open Access journal, Laryngoscope Investigative Otolaryngology as well as sharing important and timely otolaryngology updates in ENTtoday. The Society continues to support resident, medical student and Fellow presenters through our institutional travel awards.

We hope you find your time at the 2023 Combined Sections Meeting to be enjoyable and worthwhile. Thank you for attending.

THURSDAY AT A GLANCE

7:00 Breakfast with Exhibitors/View Posters - Ocean Ballroom

GENERAL SESSION - CROWN ROOM

7:45 - 8:50 Welcome and Introduction of Special Guests

8:50 Tenth Annual Patrick E. Brookhouser, MD Award of Excellence

8:55 Presidential Address

9:10 Presentation of Triological Society Gold Medal Award

9:20 - 9:45 Break with Exhibitors/View Posters - Ocean Ballroom

9:45 - 10:45 PANEL: The Second Victim: How A Medical Mishap Can Affect You, the Doctor

10:45 - 11:30 This Is How I Do It Video Session

11:30 - 12:10 PANEL: COVID-19 Update: Long term Effects on the Nose, the Ear, the Throat

12:10 - 1:00 Lunch with Exhibitors/View Posters - Ocean Ballroom & Courtyard

CONCURRENT SESSIONS 1:00 - 3:00

HEAD & NECK - CROWN ROOM

OTOLOGY/NEUROTOLOGY - CORONET ROOM

1:00 - 3:00 Head & Neck Papers and Panel

2:00 - 2:55 PANEL: Changing Landscapes in Head & Neck Cutaneous Cancer

3:00 - 3:30 Break with Exhibitors/View Posters - Ocean Ballroom

1:00 - 3:00 Otolaryngology/Neurotology Papers and Panel

1:00 - 1:55 PANEL: Migraine Management for the Otolaryngologist

3:00 - 3:30 Break with Exhibitors/View Posters - Ocean Ballroom

THURSDAY AT A GLANCE CONT'D

CONCURRENT SESSIONS 3:30 - 5:30

RHINOLOGY/ALLERGY - CROWN ROOM

LARYNGOLOGY/BRONCHOSOPHAGOLOGY - CORONET ROOM

3:30 - 5:30 Rhinology/Allergy Papers and Panel

4:30 - 5:25 PANEL: Updates and Inspirations: Management of Obstructive and Central Sleep Apnea

5:30 Adjourn

5:45 - 7:00 Vice Presidents Welcome Reception - Windsor Lawn

3:30 - 5:30 Laryngology/Bronchoesophagology Papers and Panel

3:30 - 4:25 PANEL: Dysphagia in 2023

5:30 Adjourn

5:45 - 7:00 Vice Presidents Welcome Reception - Windsor Lawn

FRIDAY AT A GLANCE

6:45 - 7:30 Business Meetings (Fellows Only)
Southern Section - Garden Room
Western Section - Continental Room

7:30 Breakfast with Exhibitors/View Posters - Ocean Ballroom

GENERAL SESSION 7:30 - 8:30 - CROWN ROOM

7:30 - 8:20 Triological Best Practices Panel

CONCURRENT SESSIONS 8:30 - 10:30

FACIAL PLASTIC & RECONSTRUCTIVE - CORONET ROOM

GENERAL & SLEEP MEDICINE - CROWN ROOM

8:30 - 10:30 Facial Plastic & Reconstructive Papers and Panel

9:30 - 10:25 PANEL: Preservation Rhinoplasty - Or, Less Can Be More

10:30 - 11:00 Break with Exhibitors/View Posters

FRIDAY AT A GLANCE CONT'D

8:30 - 10:30 General & Sleep Medicine Papers and Panel

8:30 - 9:25 PANEL: Artificial Intelligence, Machine Learning and Virtual Reality in Otolaryngology

10:30 - 11:00 Break with Exhibitors/View Posters

CONCURRENT SESSIONS 11:00 - 1:00

GENERAL, RHINOLOGY, ALLERGY, SINUS - CROWN ROOM
PEDIATRICS, LARYNGOLOGY/BRONCHOSOPHAGOLOGY - CORONET ROOM

11:00 - 1:00 General, Rhinology, Allergy, Sinus Papers and Panel

12:00 - 12:55 PANEL: Incorporating New Technologies into Your Practice: A Potpourri of Office Procedures, Biologics, Wearables, Sleep Trackers, OTC Hearing Aids

1:00 Adjourn

11:00 - 1:00 Pediatrics, Laryngology/Bronchoesophagology Papers and Panel

11:00 - 11:55 PANEL: From Bad to Worse: Button Battery Ingestion

1:00 Adjourn

AFTERNOON ACTIVITIES (REGISTRATION REQUIRED)

1:00 Golf Outing (pre-registration required)

1:15 - 1:45 How To Be an Effective Peer Reviewer (pre-registration required) - Coronet Room

1:45 - 2:30 Triological Thesis Seminar (pre-registration required) - Continental Room

1:45 - 3:15 Resident Bowl (pre-registration required) - Crown Room

3:15 - 5:00 Women in Otolaryngology Networking Event - Vista Terrace
Sponsored by Cook Medical

SATURDAY AT A GLANCE

6:30 - 7:15 Business Meetings (Fellows Only)
Middle Section - Continental Room
Eastern Section - Garden Room

7:15 - 8:15 Breakfast/View Posters - Ocean Ballroom

GENERAL SESSION 8:15 - 9:30 - CROWN ROOM

8:20 - 9:20 PANEL: Practicing in the New World - Corporate Consolidation of Otolaryngology Practices; Patient/Family Experience Measures; Incorporating APPs; Bridging the Generation Gap Between Older and Younger Colleagues

9:30 - 10:00 Break with Exhibitors/View Posters - Ocean Ballroom

CONCURRENT SESSIONS 10:00 - 12:30 GENERAL & HEAD & NECK - CROWN ROOM OTOLOGY/NEUROTOLOGY - CORONET ROOM

10:00 - 12:00 General and Head & Neck Papers and Panel

11:30 - 12:25 PANEL: HPV - Prevention, Nonsurgical and Surgical Management and Next Generation of Surgical Trials for HPV+ OP CA

12:30 - 1:15 Lunch/View Posters - Ocean Ballroom

12:30 - 1:15 Neely Physician/Scientist Meeting - Garden Room

10:00 - 12:00 Otolaryngology/Neurotology Papers and Panel

10:00 - 10:55 PANEL: HPV - How Can We Help Our Patients Do Better? Future of CI/ABI/Implantable Devices

12:30 - 1:15 Lunch/View Posters - Ocean Ballroom & Courtyard

12:30 - 1:15 Neely Physician/Scientist Meeting - Garden Room

SATURDAY AT A GLANCE CONT'D

CONCURRENT SESSIONS 1:15 - 3:30 PEDIATRIC OTOLARYNGOLOGY - CORONET ROOM GENERAL & HEAD & NECK - CROWN ROOM

1:15 - 3:30 Pediatric Otolaryngology Papers and Panel

- 2:25 - 3:20 PANEL: CHARGE Syndrome: E&M of Ear, Swallowing, Airway Issues and Establishing a Multidisciplinary Center
- 3:25 - 3:35 INVITED PRESENTATION: Update on Subspecialty Board Certifications
- 3:45 - 4:00 Coffee Break

1:15 - 3:30 General & Head & Neck Papers and Panel

- 1:15 - 2:10 PANEL: Controversies in Thyroid/Parathyroid Disease
- 3:45 - 4:00 Coffee Break

GENERAL SESSION 4:00 - 4:40 - CROWN ROOM

- 4:00 - 4:40 PANEL: Communicating in the New World: Social Media - The Good, The Bad and The Ugly
- 4:40 - 5:30 Speed Networking - Ask Us Anything (Coronet Room)
- 5:30 Adjourn

EVENING ACTIVITIES

- 5:30 - 6:30 Meet the Authors Poster Reception - Ocean Ballroom
- 6:30 Beach Bash - Boardwalk & Beach

2023 COMBINED SECTIONS MEETING

JANUARY 26-28 • HOTEL DEL CORONADO • CORONADO, CALIFORNIA

About the Triological Society

The American Laryngological, Rhinological and Otological Society, Inc., aka The Triological Society, was founded in 1895 in New York, NY. Since its founding, the Triological Society has attracted the best and brightest in academic and clinical otolaryngology. Membership in the Triological Society brings the distinction of being elected to the most prestigious society in otolaryngology. Active Fellowship is achieved by presenting a thesis in the field of otolaryngology considered acceptable to a panel of peers. For those entering the field of otolaryngology, the Society provides role models. For those who are committed to research and related scholarly activity, the Society offers fellowship with like-minded peers who share common values, interests, and concerns.

The Society disseminates scientific information by presenting the latest basic science and clinical information at scientific meetings and through publication of its scientific journals, The Laryngoscope and Laryngoscope Investigative Otolaryngology. The Society promotes research into the causes of and treatments for otolaryngic diseases by attracting promising physicians to scholarly otolaryngology research and supporting their development, providing financial support for the research efforts of young scientists, and promoting the highest standards in the field of otolaryngology-head and neck surgery.

Mission Statement

The mission of the Triological Society is to assist physicians and other health care professionals in maintaining and enhancing their knowledge of and skills in otolaryngology-head and neck surgery in pursuit of improved patient care.

Learning Objectives for This Activity

This activity is designed for otolaryngologists-head and neck surgeons and other health professionals. At the conclusion of this activity, the learner should be able to:

- Identify the causes and explain appropriate interventions of various common and uncommon disorders of the ear, nose, throat, head and neck.
- Apply knowledge of new technologies to enhance patient and practice outcomes in otolaryngology.
- Distinguish healthy and unhealthy reactions to negative patient outcomes in order to minimize physician and other healthcare worker dissatisfaction and burnout.
- Manage multidisciplinary teams with appropriate expectations of each team member so that care is streamlined, efficient, and patient and family-centered.
- Assess their own level of competence in various aspects of otolaryngology clinical practice, education, research, and practice management to identify knowledge gaps and address them effectively.

Exhibits

Exhibitors will include representatives of pharmaceutical companies, instrument companies, diagnostic equipment companies, publishers, and others. We encourage attendees to visit the exhibit hall for information that may assist in their pursuit of improved patient care. Exhibitor arrangements are in compliance with the Accreditation Council for Continuing Medical Education (ACCME) Standards for Commercial Support.

Information presented by exhibitors and oral and poster presenters does not represent an endorsement by the Triological Society.

Disclosure Information

In accordance with the ACCME Accreditation Criteria, the American College of Surgeons must ensure that anyone in a position to control the content of the educational activity (planners and speakers/authors/discussants/moderators) has disclosed all financial relationships with any ineligible company held in the last 24 months. Please note that first authors were required to collect and submit disclosure information on behalf all other authors/contributors, if applicable.

Please see the insert to this program for the complete disclosure list.

Program Evaluation and CME Certificates

Participant comments on program evaluation forms assist Program Advisory Committees in determining the direction of future educational activities. We appreciate your input and request that you complete a program evaluation in exchange for a CME certificate of attendance. Records are maintained in the Administrative Office of the Society and maintained by the American College of Surgeons for Fellows of the College. Requests may be made by sending a self-addressed envelope to: Triological Society • 1000 Jorie Blvd Suite 385 • Oak Brook, IL 60523.

CONTINUING MEDICAL EDUCATION CREDIT INFORMATION

Accreditation

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of American College of Surgeons and Triological Society. The American College of Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

AMA PRA Category 1 Credits™

The American College of Surgeons designates this live activity for a maximum of **20 AMA PRA Category 1 Credits™**. Physicians should claim only the credit commensurate with the extent of their participation in the activity.



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Award of CME credits by ACS is based on compliance of the program with the ACCME accreditation requirements and does not imply endorsement by ACS of the content, the faculty, or the sponsor of the program.

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Guests of Honor

Eastern Section	Norma de Oliveira Penido, MD PhD
Southern Section	Qanta Ahmed, MD FACP FCCP FAASM
Western Section	Michael E. Hoffer, MD FACS
Middle Section	Marlan R. Hansen, MD

Citation Awardees

Eastern Section	Jean Anderson Eloy, MD FACS Valerie A. Flanary, MD FACS Sonya Malekzadeh, MD FACS James E. Saunders, MD
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Southern Section	Neal Beckford, MD Charles W. Cummings, MD Paul R. Lambert, MD FACS
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Western Section	Nicholas Bambakidis, MD FAANS FAHA C. Phillip Daspit, MD FACS (Posthumous Award) David S. Haynes, MD FACS MMHC
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Middle Section	Jay Rubinstein, MD PhD D. Bradley Welling, MD PhD FACS
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Middle Section George Adams, MD Young Faculty Award

Sidharth V. Puram, MD PhD

10th Annual Patrick E. Brookhouser, MD Award of Excellence

Jesus E. Medina, MD FACS

Triological Society Gold Medal Award

Myles L. Pensak, MD FACS

Guests of Honor

Honored by Eastern Section • Norma de Oliveira Penido, MD PhD



Norma de Oliveira Penido, MD, PhD is an Associate Professor and Head of Otolaryngology-Neurotology at the Department of Otolaryngology-Head and Neck Surgery at Universidade Federal de São Paulo. Having authored and co-authored 110+ peer-reviewed scientific papers, contributed as a reviewer for 25+ scientific journals, and presented works at multiple national and international conferences, Dr. Penido's contributions have acclaimed recognition from honorable subject experts around the globe. Dr. Norma de Oliveira Penido's academic career is decorated with several reputed awards and funding, having received a grant from the National Council for Scientific and Technological Development (CNPq)--a foundation linked to the Ministry of Science and Technology (MCT), to support Brazilian research--for her distinguished contributions in the field (Sudden Sensorineural Hearing Loss). Dr. Penido is currently a member of the editorial board and reviewer for *Frontiers* and *Brazilian Journal of Otorhinolaryngology*.

Honored by Southern Section • Qanta Ahmed, MD FACP FCCP FAASM



Dr. Ahmed is Associate Professor of Medicine (Clinical) at the New York University Langone Long Island School of Medicine, an author and broadcast media commentator. A graduate of the University of Nottingham, England, Dr. Ahmed has practiced subspecialty medicine in the United Kingdom, the United States and the Kingdom of Saudi Arabia and continues her large full-time sleep disorders practice in Garden City, New York. Currently, a triple board-certified pulmonologist and sleep disorders specialist, she is widely published in the peer reviewed medical literature. She is now a leading expert on Central Sleep Apnea Syndrome and Transvenous Phrenic Nerve Stimulation.

Dr. Ahmed is also Honorary Professor at the School of Health and Life Sciences at Glasgow Caledonian University in Scotland, UK and Honorary Fellow at the Technion-Israel Institute of Science and Technology in Haifa, Israel.

She holds fellowships at the American College of Chest Physicians, the American College of Physicians and the American Academy of Sleep Medicine. In December 2015, she was naturalized as an American gaining citizenship on the basis of the US National Interest in recognition of her body of academic work and maintains dual US and UK citizenship.

Her journalism has been recognized with several funded fellowships in the field of journalism by her journalist peers. In 2010 she became the first physician, and first Muslim woman to be awarded the Templeton-Cambridge Fellowship in Journalism at the University of Cambridge, England. In 2014, Dr. Ahmed was awarded the Ford Foundation Public Voices Fellowship in New York City. In July 2019 she inducted first into the Visiting Fellowship, and soon after, Senior Fellowship at the Independent Women's Forum in recognition of her ability to speak on complex issues reaching audiences across political divides.

While medicine is her primary career, she has a decades-long deep and abiding interest in international religious freedom, international religious persecution, combating contemporary antisemitism and combating violent and nonviolent

Islamism leading her to travel, bear witness and report on those most impacted.

She has traveled to Pakistan's Swat Valley with the Pakistani military shortly after the Taliban was repelled to meet rehabilitating children who were former jihadist operatives of the Pakistan Taliban where she elicited a history from an adolescent boy of his grooming, recruitment and captivity by the Taliban in Urdu.

Almost ten years later in Northern Iraq in the aftermath of the war with ISIS, she consulted with a Yazidi boy and his family as the child recounted his abduction to Mosul and indoctrination as an ISIS child soldier. Dr. Ahmed has been deeply affected by her repeated travel to the Kurdish Region in Northern Iraq visiting the Yazidi community surviving the genocide perpetrated by ISIS, twice as a visiting professor to the University of Duhok to examine the aftermath on the entire Kurdish community. She met with the late Baba Sheikh Khurto Hajji Ismail, the leader of the Yazidis at Lalish in the Duhok Governate of the Kurdish Region. She has also met with the post ISIS Christian communities of Nineveh in Federal Iraq outside of the Kurdish Regional Governate, visited their desecrated and demolished churches and met with a fragile Christian community seeking to rebuild surrounded by roving Iranian militias.

Meeting former child operatives afforded the insight to deliver testimony to US Congress in June 2012, as a witness for the Majority in the 5th Investigative Hearings on Radical Islam in the United States at the request of Chairman of the Homeland Security Committee, Congressman Peter King.

She writes and broadcasts on the heterodox suffering fundamentalism, the menace of Islamism posed both to Islam and the West and the critical distinction of Islamism from Islam. Her prolific output in the American, British, Australian, Pakistani, Israeli and recently the Saudi Arabian media numbers around 400 bylines, hundreds of media appearances and multiple ongoing publications

Honored by Western Section • Michael E. Hoffer, MD FACS



Michael E. Hoffer, MD is a Professor of Otolaryngology and Neurological Surgery at the University of Miami who came to Miami after a career in the US Navy. Dr. Hoffer's primary area of emphasis includes the study of inner ear and brain damage from traumatic insults. He has an active clinical practice with an emphasis on adult and pediatric cochlear implants as well as individuals with balance disorders. His basic science lab performs rapidly translatable studies that involve basic and clinical science. Dr. Hoffer's current work involves studying the mechanisms of novel pharmaceuticals as countermeasures for mild traumatic brain injury and as protective agents to stabilize cognitive impairment in populations at risk for dementia. Dr. Hoffer graduated from UCSD Medical School, was a resident at the University of Pennsylvania, and did a Neurotology Fellowship at the Ear Research Foundation.

Honored by Middle Section • Marlan R. Hansen, MD



Marlan R. Hansen, MD is the Brian F. McCabe Distinguished Chair and Professor of the Department of Otolaryngology-Head and Neck Surgery and Professor of Neurosurgery and Molecular Physiology and Biophysics at the University of Iowa. He is the Co-Director of the Institute of Clinical and Translational Science at Iowa.

Dr. Hansen received his Bachelor of Science degree from Brigham Young University and completed medical school at the University of Chicago, Pritzker School of Medicine. He completed Otolaryngology residency and a postdoctoral research fellowship at the University of Iowa followed by a surgical fellowship in Neurotology/Skull Base Surgery at the House Ear Clinic/USC in Los Angeles. Following training, he joined the faculty at the University of Iowa.

Dr. Hansen's research involves multidisciplinary approaches to basic, translational, and clinical investigations broadly related to auditory neurobiology and vestibular schwannoma tumorigenesis. His lab uses tissue and bioengineering approaches to enhance the preservation of cochlear structures and function following implantation. In clinical research, he collaborates with a large multidisciplinary team to evaluate factors that enhance outcomes with cochlear implantation including hearing preservation and robotics-assistance. He is a co-founder and chief medical officer for iotaMotion, Inc that provides robotics-assistance technologies for cochlear implantation.

Citation Awardees

Eastern Section • Jean Anderson Eloy, MD FACS



Dr. Eloy is currently Distinguished Professor and Vice Chair of Otolaryngology-Head and Neck Surgery at Rutgers New Jersey Medical School. He serves as the Director of Rhinology and Sinus Surgery, Director of Otolaryngology Research, and Co-Director of the Endoscopic Skull Base Surgery Program. Dr. Eloy also has joint appointments as Distinguished Professor of Neurological Surgery and Distinguished Professor of Ophthalmology and Visual Sciences at Rutgers New Jersey Medical School. He is currently the Co-President of the New Jersey Academy of Otolaryngology/New Jersey Academy of Facial Plastic Surgery, and the Chair and Chief of Service of the

Department of Otolaryngology-Head and Neck Surgery at Cooperman Barnabas Medical Center. His clinical/surgical interests and area of expertise include medical and surgical management of refractory rhinosinusitis, endoscopic management of sinonasal neoplasia, cerebrospinal fluid rhinorrhea, ventral skull base lesions, endoscopic revision sinus surgery, and computer-aided sinus surgery.

Throughout his career, Dr. Eloy demonstrated a thirst and proficiency for research, education, and excellence in patient care. His contributions to the fields of Otolaryngology-Head and Neck Surgery and Neurological Surgery include over 480 journal articles, over 450 peer-reviewed articles, 6 books, and 43 book chapters in the subfield of Rhinology, Endoscopic Sinus and Skull Base Surgery, over 750 scientific presentations at regional, national, and international otolaryngologic and neurological surgery meetings, as well as over 410 invited lectures and oral presentations. His research topics encompass a wide area of

the fields of otolaryngology, neurological surgery, and ophthalmology, and include endoscopic and open sinus surgery, minimally invasive endoscopic skull base surgery, malpractice in otolaryngology, as well as studies of gender disparities in otolaryngology and other surgical specialties. Dr. Eloy also started a successful fellowship program in Rhinology and Endoscopic Skull Base Surgery eight years ago (the only such program in the state of New Jersey).

Dr. Eloy is a pioneer and undisputable thought leader in Otolaryngology - Head and Neck Surgery and has had a tremendous and singular impact in shaping scholarly activity and understanding of Otolaryngology over the last 10 years by championing the use of large clinical databases such as SEER, NSQIP, NEISS, NIS, NCDB, amongst others, for research in Otolaryngology - Head and Neck Surgery. This can be evidenced by his substantial and high impact body of scholarship in many topics in the field. He has also impacted the mainstream approach to otolaryngologic research by having other institutions follow his research methodology and approach in the inclusion and empowering of medical students in taking a leadership role in research. He was also one of the first otolaryngology faculty to systematically study gender disparities in Otolaryngology-Head and Neck Surgery and other surgical subspecialties.

Dr. Eloy already has an h-index of **48**, which is quite exceptional for 14 years as a faculty, a relatively short time period for his work to be cited. This is even more impressive for a small surgical subspecialty such as Otolaryngology-Head and Neck Surgery. For comparison to his peers, the average professor in Otolaryngology has an h-index of 15.6 and the average academic chair in the field has an h-index of 16.4.

Dr. Eloy is a member of the Rutgers New Jersey Medical School Admission Committee, the Robert Wood Jonson Barnabas Health University Physician Associates board of directors, and is involved in Otolaryngology-Head and Neck Surgery resident training.

Dr. Eloy has been the recipient of numerous accolades, including the prestigious **Triological Society Eastern Section Vice Presidential Citation, and the Edward J. III Physician Excellence in Medicine Award.**

Eastern Section • Valerie A. Flanary, MD FACS



Dr. Flanary is a Board Certified Pediatric Otolaryngologist at Children's Wisconsin and Full Professor, Otolaryngology and Human Communication Sciences at the Medical College of Wisconsin. She also serves as Director, Racial Equity and Inclusion for the Medical College of Wisconsin. She has been in practice at MCW since 1995. She practices the full range of Pediatric Otolaryngology including ear disease, airway disorders and head and neck masses. Dr. Flanary is active in teaching and mentoring at all levels in otolaryngology including high school, medical school, residency and fellowship. She has published in multiple areas in otolaryngology and on issues of diversity and

inclusion. Her current research interests include socioeconomic determinants of health and underrepresented minority representation in otolaryngology. Dr. Flanary served as Academic Director on the Board of Academy of Otolaryngology, Head and Neck Surgery (AAOHNS). She has held several national leadership roles in the organization including Governing Board, Women in Otolaryngology, and Chair, Diversity Committee. She is active in several national organizations including the Triological Society, Society for the Advancement of Ear, Nose and Throat Disorders

in Children, American Society of Pediatric Otolaryngologist and the Society of University Otolaryngologists and is a Fellow of the American College of Surgeons.

Eastern Section • Sonya Malekzadeh, MD FACS



Sonya Malekzadeh, MD, FACS, is Professor of Otolaryngology-Head and Neck Surgery at Georgetown University School of Medicine, Vice Chair for Education and Residency Program Director in the Department of Otolaryngology-Head and Neck Surgery at MedStar Georgetown University Hospital.

Dr. Malekzadeh is a leader in the field of medical education and simulation. Her vision and work have led to the development and dissemination of several innovative training tools and programs. COCLIA (Comprehensive Otolaryngologic Curriculum, Learning through Interactive Approach), an on-line longitudinal course, is utilized by many otolaryngology residency programs. She created a series of low-cost simulators to onboard novice residents with basic surgical skills. Over a decade ago, she helped to develop the first ORL Emergencies Boot Camp and continues to co-direct this annual event. She is currently pursuing the development of a national boot camp to ensure broad access and curriculum standardization.

Active in local and national societies, she has chaired and served as member of numerous committees. As Education Coordinator for the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS), she led to the development of educational products and programming for the Foundation's membership. She is a past member of their Board of Directors and was also the inaugural Chair of the Women in Otolaryngology Section. Dr. Malekzadeh is the past-Chair of the Otolaryngology Program Directors Organization and President of the Society of University Otolaryngologists.

Dr. Malekzadeh has been honored many times with outstanding professional awards. She is the recipient of the 2017 Karen Gale Outstanding Achievement Award at Georgetown and the 2011 AAO-HNS Helen B Krause Trailblazer Award, recognizing her efforts in mentoring and supporting women in medicine. She received multiple Outstanding Teaching Awards for her educational commitment within the Department of Otolaryngology.

Dr. Malekzadeh received her medical degree from George Washington University School of Medicine in Washington, DC, where she also completed her internship in general surgery. After fulfilling her residency in Otolaryngology-Head and Neck Surgery at The University of Maryland in Baltimore, she joined the faculty in the Department of Otolaryngology-Head and Neck Surgery at Georgetown in 2001. She served as Chief of ENT at the Washington DC Veteran's Hospital from 2008-2018.

Eastern Section • James E. Saunders, MD



James Saunders is a Professor of Otology/Neurotology at Dartmouth Hitchcock Medical Center. He completed an MD at University of Oklahoma, Residency & Research training in Otolaryngology at Duke University Medical Center, and a Neurotology Fellowship at the House Ear Institute. His research includes cochlear implant outcomes, tympanoplasty techniques, skull base surgery and remote hearing screening in low resource environments. He is past AAO-HNSF Coordinator for International Affairs and serves on the Steering Committee of the World Hearing Forum.

Southern Section • Neal Beckford, MD



Neal S. Beckford, MD FACS is an Associate Professor of Otolaryngology/Head and Neck Surgery at the University of Tennessee health Science Center in Memphis, Tennessee. He is the Director of General Otolaryngology Clinical Services, with strong interests in endocrine surgery, laryngology and dysphagia.

Dr. Beckford studied microbiology at The Ohio State University and obtained his Doctorate of Medicine at Howard University College of Medicine. He finished his residency in Otolaryngology/Head and Neck Surgery at the University of Pittsburgh in 1985 and joined the faculty of the University of Tennessee upon graduation. There, he pursued interests in head and neck oncology and laryngology, starting a multidisciplinary voice and swallowing center in 1987. Dr. Beckford left the University in 1993 as the Interim Department Chairman, pursuing an active private practice career, only to return to the University in 2018.

Dr. Beckford has been active in organized medicine, with leadership positions at the state and local level. He was a member of the Tennessee Board of Medical Examiners, the state medical licensing board for over 15 years. His community focus has been on the arts, serving on the boards of the local opera, performance theater and youth jazz organizations for many years. An amateur musician, he is a long serving member of the local community wind symphony, as well as church music organizations and other local music groups.

Southern Section • Charles W. Cummings, MD



Dr. Charles Cummings was born in Boston, Massachusetts, in November of 1935. He graduated from Deerfield Academy in 1953, Dartmouth College in 1957, and the University of Virginia Medical School in 1961. He was an intern at Dartmouth and completed a year of general surgery residency at the University of Virginia. Dr. Cummings entered the Air Force in 1963, was discharged in July 1965, and entered residency training in Otolaryngology-Head and Neck Surgery at the Harvard Medical School, Massachusetts Eye and Ear Infirmary, finishing the program in 1968.

Dr. Cummings worked in private practice in Boston and on the clinical staff at the Massachusetts Eye and Ear Infirmary until the end of 1975 when he moved to Syracuse, New York and became an Associate Professor in the Department of Otolaryngology-Head and Neck Surgery at the State University of New York Upstate Medical University. Two years later, he assumed chairmanship of the Department of Otolaryngology-Head and Neck Surgery at the University of Washington where he remained until the end of 1990 when he became Director of the Department of Otolaryngology-Head and Neck Surgery at Johns Hopkins. He was Chief of Staff of The Johns Hopkins Hospital from 1997 through 1999. In 2003, Dr. Cummings stepped down as Director. Dr. Cummings was also the Executive Medical Director for Johns Hopkins International from 2003 until 2011. In addition, he has served as interim chair of the Department of Dermatology (2007 - 2009) and the Department of Orthopaedics from (9/2011 - 9/2013). He returned to the Department of OTO/HNS at that time as Distinguished Service Professor of Oncology and Emeritus Andelot Professor of Otolaryngology/Head and Neck Surgery. He retired from Johns Hopkins in June 2022.

He has written 144 scientific papers and was the founder and the Senior Editor of the four-volume text, Cummings Otolaryngology-Head and Neck Surgery, which is now in its seventh edition, edited by Dr. Paul Flint. He has also co-authored two surgical atlases, one on laryngeal surgery and another on surgical access and reconstruction in the field of laryngology and head and neck surgery. Dr. Cummings served as a Director of the American Board of Otolaryngology, as Chairman of the Residency Review Committee and Chairman of the Advisory Council for Otolaryngology to the American College of Surgeons. He is a Past President of the American Association for Academic Departments of Otolaryngology, American Broncho-Esophagological Association, the American Academy of Otolaryngology-Head and Neck Surgery and the American Society for Head and Neck Surgery. Dr. Cummings has received numerous honors for his work, including the Chevalier Jackson Award (American Broncho-Esophagological Association), the Newcomb Award (American Laryngological Association), the Ogura lecturer for the Triological Society, The Hayes Martin lecturer for the American Head and Neck Society, The Daniel Baker Lecturer for the Triological Society, and others. He was presented with the 2009 Johns Hopkins Heritage Award, and the Johns Hopkins Distinguished Alumnus award in 2013. He was the recipient of the Walter Reed Distinguished Alumni Award from the University of Virginia in 2017.

He has been honored by many International Head and neck Societies as an honorary member.

Many of his former residents and faculty are currently in meaningful academic positions or Chairing Departments of Otolaryngology-Head and Neck Surgery at leading Academic Institutions, a source of great personal pride.

Southern Section • Paul R. Lambert, MD FACS



Paul Lambert, MD is Chair Emeritus and Distinguished University Professor at MUSC. He served as chair of that department from 1999-2022; previously he was on the faculty at the University of Virginia, serving as Vice-Chair.

During his career he has been involved in a number of leadership positions, including president of the American Otological Society (AOS), American Neurotology Society (ANS), American Board of Otolaryngology-Head and Neck Surgery, vice president of the Southern Section of the Triological Society, and vice president of the AAO-HNS. He has authored more than 180 manuscripts and book chapters and several textbooks. He is a past recipient of the Triological Society Fowler Award.

Dr. Lambert is a graduate of Duke University and Duke University Medical School. To say he is an avid Duke basketball fan misses the mark. He completed residency at UCLA and fellowship in otology-neurotology at the House Ear Institute. With less administrative duties he now has more time to spend at a "cabin" in the mountains of Western North Carolina with his wife of 46 years, Debbie.

Western Section • Nicholas Bambakidis, MD FAANS FAHA



Nicholas C. Bambakidis, MD, is the Vice President and Director of the Neurological Institute and the Chair of the Department of Neurological Surgery at University Hospitals as well as the Harvey Huntington Brown, Jr., Chair in Neurological Surgery and Professor of Neurological Surgery at Case Western Reserve University in Cleveland, Ohio. Dr. Bambakidis is internationally recognized as a leader in the management of cerebrovascular and skull base surgery. He has published extensively in prestigious medical journals on an array of topics in his field of expertise, authoring or co-authoring more than 100 articles, invited reviews, and editorials. He is the editor of four esteemed

neurosurgical textbooks and a reviewer on six leading journals in neurosurgery. Dr. Bambakidis served as President of the Congress of Neurological Surgeons in 2022 and is a member of the American Association of Neurological Surgeons, Society of Neurointerventional Surgery, and Society of Neurological Surgeons.

Western Section • David S. Haynes, MD FACS MMHC



David Haynes is a professor in the departments of Otolaryngology, Neurosurgery and Hearing and Speech Sciences at Vanderbilt University Medical Center. He is the Director of the division of Neurotology within the department of Otolaryngology and is co-director of the multidisciplinary Skull base Center. In addition, he directs the internationally recognized Neurotology Fellowship training program and the Vanderbilt Cochlear Implant Program.

His research involves investigating treatment optimization of patients with hearing loss and skull base disorders as well as optimizing health care delivery to patients with otologic disorders. His research has appeared in leading academic journals including *The Laryngoscope* and *Otology and Neurotology*. He has hosted many international conferences including the XIV International Pediatric Cochlear Implant Conference in Nashville, TN. He also serves on the executive board of the Hearing Health Foundation, New York, New York.

Western Section • C. Phillip Dasplit, MD FACS (Posthumous Award)



C. Phillip Dasplit, MD FACS, a Triological Society Fellow since 1994 and 2004 Western Section Vice President, passed away on March 26, 2022. Dr. John House shared the following tribute: Phil was born in New Orleans, Louisiana on Sept. 5, 1943. He attended LSU-Baton Rouge, graduating in 1965. Medical school was also at LSU-New Orleans, graduating in 1968. He was an active-duty flight surgeon in the Navy from 1969-1972 and stayed on in the active reserve, retiring as a Captain. Following his active-duty military service he completed his residency at University of California, San Francisco. Phil completed a fellowship in Otolaryngology-Neurotology at House Ear

Clinic in 1978. Following fellowship, he went into practice in Phoenix, affiliated with Barrow Neurologic Institute, St. Joseph's Medical Center, and Phoenix Children's Hospital. Dr. Dasplit served as the Western Section Vice President in 2004 as well as several program committees. He was an esteemed member of the American Otolaryngological Society, serving on the AOS Council as the Editor-Librarian for 5 years and then as President in 2011. He was a Fellow member of the American Neurotology Society for almost 50 years, inducted in 1973. Other memberships

Phil was very proud of were the Triological Society, American College of Surgeons, the Otosclerosis Study Group and the AAO-HNS/F to name a few. Phil published more than 20 scientific papers. We will all miss Phil.

Middle Section • Jay Rubinstein, MD PhD



Dr. Rubinstein received ScB/ScM degrees in Engineering at Brown University in 1981/83. He received an MD and PhD in Bioengineering at the University of Washington in 1987/88. He completed postdoctoral research training at MIT and residency in Otolaryngology in 1994 at the Massachusetts Eye and Ear Infirmary. He completed a Neurotology fellowship at the University of Iowa in 1995 staying as Assistant then Associate Professor of Otolaryngology and Bioengineering. In 2003/04 he was the Boerhaave Professor at Leiden University, the Netherlands. He is currently Virginia Merrill Bloedel Professor of Otolaryngology and Bioengineering and Director, Bloedel

Hearing Research Center, University of Washington. He is currently President of the Politzer Society and has been President of the American Auditory Society and the Association for Research in Otolaryngology. He is a member of the Collegium Otorhinolaryngologicum, the American Institute of Medical and Biological Engineering as well as a Senior Member of the Institute for Electrical and Electronics Engineers. He has published over 140 peer-reviewed articles in both clinical and basic science journals and has mentored 18 predoctoral and postdoctoral trainees in basic and translational research, as well as providing clinical training to a large number of otolaryngology residents and fellows. He maintains a surgical practice at both UW Medical Center and Seattle Childrens. His laboratory studies models of, signal processing in, and perception with cochlear implants, and the development of a vestibular implant, as well as human behavioral characterization of genetic hearing loss and primate models of auditory gene therapy.

Middle Section • D. Bradley Welling, MD PhD FACS



Dr. Welling is the Walter Augustus Lecompte Professor of Otolaryngology Head and Neck Surgery in the Harvard School of Medicine and Massachusetts Eye and Ear Infirmary and Massachusetts General Hospital. He received his MD from the University of Utah, his residency in Otolaryngology-Head and Neck Surgery at the University of Iowa, and fellowship in Otolaryngology, Neurotology, and Cranial Base Surgery affiliated with Vanderbilt University in Nashville, Tennessee. He completed a Ph.D. in pathobiology at The Ohio State University.

Dr. Welling's clinical practice focuses on the surgical treatment of cranial base tumors and on hearing preservation and restoration. He has a long-standing interest in finding better treatments for NF2 schwannomatosis including vestibular schwannomas. He has conducted multiple multi-center peer-reviewed clinical trials. He has published over 175 peer-reviewed scientific articles and 34 chapters.

Dr. Welling chaired the Departments of Otolaryngology Head and Neck Surgery at The Ohio State University and Harvard. He is a senior advisor to the Board of Directors of the American Board of Otolaryngology Head and Neck Surgery and the Residency Review Committee of the Accreditation Council on Graduate Medical Education (ACGME). He has served as President the American Otologic Society, the American Neurotologic Society and is currently President of the US

group of the Collegium Oto-Rhino-Laryngologicum Amicitiae Sacrum. He served as the inaugural Editor-in-Chief of Laryngoscope Investigative Otolaryngology. He serves as the Chair of the Medical Committee on the Board of Directors for Boys Town National Research Hospital and is a member of the medical board of Daybreak Vision Project.

Middle Section George Adams, MD Young Faculty Award

Sidharth V. Puram, MD PhD



Dr. Sid Puram is Chief of Head and Neck Surgery at Washington University. Dr. Puram graduated from MIT, followed by an MD-PhD at Harvard Medical School with doctoral studies in the laboratory of Dr. Azad Bonni. He went on to residency at Harvard/Massachusetts Eye and Ear with an in-folded postdoctoral fellowship with Dr. Bradley Bernstein at MIT Broad/Massachusetts General. Thereafter, he complete a surgical oncology/microvascular free flap fellowship at the James Cancer Center/Ohio State University. Currently, Dr. Puram maintains a clinical practice focused on head and neck oncologic surgery and microvascular reconstruction. His R01-funded group has been a leader in genetic, transcriptional, and epigenetic heterogeneity in head and neck cancer and its relationship to cancer phenotypes including metastasis and treatment response.

10th Annual Patrick E. Brookhouser, MD Award of Excellence

Jesus E. Medina, MD FACS



Jesus E. Medina, MD FACS, a native of Peru, completed his training in Otorhinolaryngology at Wayne State University in Detroit. Following this, he completed a Fellowship in Head and Neck Oncologic Surgery at the M.D. Anderson Hospital and Tumor Institute in Houston. He began his academic career in 1980 as an Assistant Professor in the Department of Head and Neck Surgery at M.D. Anderson. In 1984, he accepted a position as an Associate Professor and Director of the Head and Neck Cancer Program in the Department of Otorhinolaryngology at the University of Oklahoma. He became Chairman of that Department in 1991 and held the Paul & Ruth Jonas Professor in Cancer Treatment and Research until December 2009. He is currently a Professor in the Department of Otorhinolaryngology.

Dr. Medina has devoted his career to the care of patients with head and neck cancer. In addition, he has authored four textbooks and numerous scientific publications and book chapters on a variety of topics in head and neck oncology. An active scholar, he has lectured extensively throughout the United States and around the world.

Dr. Medina is a member of the American Academy of Otolaryngology-Head and Neck Surgery, American College of Surgeons, the Triological Society, the American Laryngological Association, and the American Head and Neck Society. He has served as a Director of the American Board of Otolaryngology and as Member of the Residency Review Committee for Otolaryngology. He has been President of the Triological Society, the American Head and Neck Society and the American

Board of Otolaryngology. He has been a member of the Board of Directors and candidate for President of the American Academy of Otolaryngology Head and Neck Surgery.

Dr. Medina has received numerous institutional and national organization Awards, including the University of Oklahoma “Dean’s Award for Distinguished Medical Service”, the University of Oklahoma “Otis Sullivant Award” and an Honorary Degree of Doctor of Humane Letters, which is the highest honor granted by the University of Oklahoma. He has also received the Honor and the Distinguished Service Awards from the American Academy of Otolaryngology-Head & Neck Surgery, an American Cancer Society Professor of Clinical Oncology Award and several Presidential Citations from the American Head and Neck Society and the Triological Society.

Jesus and his wife Libby have been married for 45 years, they have three children: Katherine, Joey and Kristine, and they are delighted with their seven grandchildren and a great granddaughter.

Triological Society Gold Medal Award

Myles L. Pensak, MD FACS



Myles L. Pensak, MD, FACS served as the H.B. Broidy Professor and Chairman of the Department of Otolaryngology-Head and Neck Surgery and Professor of Neurosurgery at the University of Cincinnati Academic Health Center from 2004-2021. Currently a Professor Emeritus in the Department Otolaryngology-Head and Neck Surgery and Neurosurgery he is a recognized international authority of diseases of the ear and skull base, with a particular interest in acoustic neuroma, petroclival meningioma, tumors of the jugular foramen and malignancies of the temporal bone.

A Board Certified neurotologist and otolaryngologist, he is an active member of the American Academy of Otolaryngology-Head and Neck Surgery, the Otologic and Neurotologic Societies and the American Laryngological, Rhinological and Otological Society (aka The Triological Society). He is the recipient of both the American Academy of Otolaryngology-Head and Neck Surgery Honor Award and the Distinguished Service Award. In 1992 he was awarded the acclaimed “Mosher Award” by The Triological Society, served as the Society’s President in 2009 and currently serves as the Executive Vice President of The Triological Society. Dr. Pensak was the 2019 Daniel Drake Medal recipient, the highest honor awarded by the UC College of Medicine.

His clinical expertise has earned him recognition in “Best Doctors in America” and “America’s Top Doctors”. His first authored papers have appeared in numerous professional journals, and he has presented his findings to scientific societies on both the national and international levels.

THANK YOU

The Society extends a special thank you to the following for their contributions to the 2023 Combined Sections Meeting:

Sujana Chandrasekhar, MD, has given her time and expertise in planning the 2023 Combined Sections Meeting Program. This is the first year of her three-year term as Program Chair.

Daniel Deschler, MD, as Thesis Chair, conducts the Thesis Seminar each January which is open to all candidates for Fellowship as well as potential candidates.

Shawn Newlands, MD, has continued to coordinate the annual Physician/Scientist seminar named after its founder, J. Gail Neely, MD, who passed away in 2017.

Drs. Michael Hoffer, Al Merati, Stacey Gray, Stacey Ishman and Lamont Jones who plan and execute the Resident Bowl.

Sam Selesnick, MD, will present "Tips for Peer Reviewers" for current reviewers and those interested in reviewing for the Laryngoscope and Laryngoscope Investigative Otolaryngology.

The Triological Society wishes to recognize and thank the following companies for their monetary commercial promotion: Advanced Bionics, Bryan Medical, Cook Medical, DePuy Synthes, Grace Medical, MED-EL, Oticon Medical, Pentax Medical, Zeiss.

Please visit the Exhibit Hall and Kiosks in the Ocean Ballroom and thank them for their support.

Thank you to the Program Committee, moderators, panelists, and all podium and poster presenters.

**TRIOLOGICAL SOCIETY COMBINED
SECTIONS MEETING
JANUARY 26-28, 2023
HOTEL DEL CORONADO, CALIFORNIA**

THURSDAY JANUARY 26, 2023

7:00 **BREAKFAST WITH EXHIBITORS - Ocean Ballroom**

GENERAL SESSION - CROWN ROOM

7:45 **Welcome by Peter A. Weisskopf, MD FACS, Phoenix, AZ, Western
Section Vice President**

7:50 **Eastern Section Guest Introductions by Sujana S. Chandrasekhar,
MD FACS, New York, NY, Eastern Section Vice President**

Citation Awardees:

Jean Anderson Eloy, MD FACS, Newark, NJ
Valerie A. Flanary, MD FACS, Milwaukee, WI
Sonya Malekzadeh, MD FACS, Washington, DC
James E. Saunders, MD, Lebanon, NH

Guest of Honor:

**Building Globalized Science: The Importance of Cross-
Border Joint Research**

Norma de Oliveira Penido, MD PhD, Sao Paulo, Brazil

8:05 **Southern Section Guest Introductions by M. Boyd Gillespie, MD
MSc FACS, Memphis, TN, Southern Section Vice President**

Citation Awardees:

Neal Beckford, MD, Memphis, TN
Charles W. Cummings, MD, Baltimore, MD
Paul R. Lambert, MD FACS, Charleston, SC

Guest of Honor:

On Ringing the Bell: A Physician's Survivorship

Qanta Ahmed, MD FACP FCCP FAASM, New York, NY

- 8:20 Western Section Guest Introductions by Peter A. Weisskopf, MD FACS, Phoenix, AZ Western Section Vice President**
Citation Awardees:
Nicholas Bambakidis, MD FAANS FAHA, Cleveland, OH
C. Phillip Daspit, MD FACS, Paradise Valley, AZ (Posthumous Award)
David S. Haynes, MD FACS MMHC, Nashville, TN
Guest of Honor:
All I Needed to Know to Be a Good Attending - I Learned in Kindergarten - Well Almost
Michael E. Hoffer, MD FACS, Miami, FL
- 8:35 Middle Section Guest Introductions by Bruce J. Gantz, MD, FACS, Iowa City, IA Middle Section Vice President**
Citation Awardees:
Jay Rubinstein, MD PhD, Seattle, WA
D. Bradley Welling, MD PhD FACS, Boston, MA
Guest of Honor:
Innovation through Intergenerational Collaboration
Marlan R. Hansen, MD, Iowa City, IA
- Presentation of Middle Section George Adams, MD Young Faculty Award**
Sidharth V. Puram, MD PhD, St. Louis, MO
Presented by Bruce J. Gantz, MD, FACS, Middle Section Vice President
- 8:50 Presentation of 10th Annual Patrick E. Brookhouser, MD Award of Excellence to Jesus E. Medina, MD FACS, Oklahoma City, OK**
Introduction by Ralph B. Metson, MD FACS, President
- 8:55 Presidential Address**
Post-Pandemic Priorities
Ralph B. Metson, MD FACS, Boston, MA
- 9:10 Presentation of Triological Society Gold Medal Award to Myles L. Pensak, MD FACS, Cincinnati, OH**
Introduction by Ralph B. Metson, MD FACS, President
- 9:18 Sections Meeting Highlight Overview by Program Chair Sujana S. Chandrasekhar, MD FACS**
- 9:20 - 9:45 BREAK WITH EXHIBITORS - Ocean Ballroom**
- 9:45 - 10:45 PANEL**
The Second Victim: How A Medical Mishap Can Affect You, the Doctor
Moderators:
Karen M. Kost, MD, Westmount, QC Canada

David E. Eibling, MD FACS, Pittsburgh, PA

Panelists:

Michael Brenner, MD FACS, Ann Arbor, MI

Hillary Newsome, MD, Farmington, CT

10:45 - 11:30

TRIOLOGICAL VIDEO SESSION

This is How I Do It

Moderator:

Vikash K. Modi, MD, New York, NY

Panelists:

Endoscopic Anterior and Posterior Cricoid Split for Bilateral Vocal Fold Paralysis

Vikash K. Modi, MD, New York, NY

Inferior Meatus Augmentation Procedure (IMAP) for Treatment of Empty Nose Syndrome

Jayakar V. Nayak, MD PhD, Palo Alto, CA

Endoscopic Posterior Rotation Flap for Posterior Glottic Insufficiency

Julina Ongkasuwan, MD, Houston, TX

Scarless Neck Feminization: Chondrolaryngoplasty Through Endoscopic Transoral Vestibular Approach

Victoria E. Banuchi, MD MPH

Vomer-Rostrum Mucosal Flap for Exposed Bone Coverage After Sphenoid Sinusotomy

Carlos D. Pinheiro-Neto, MD

11:30 - 12:10

PANEL

COVID-19 Update: Long term Effects on the Nose, the Ear, the Throat

Moderator:

Kathleen L. Yaremchuk, MD MSA, Detroit, MI

Panelists:

Voice

Joel H. Blumin, MD FACS, Milwaukee, WI

Audiovestibular

Sujana S. Chandrasekhar, MD FACS, New York, NY

Olfaction

Evan R. Reiter, MD FACS, Richmond, VA

12:10 - 1:00 LUNCH WITH EXHIBITORS - Ocean Ballroom & Courtyard

THURSDAY CONCURRENT SESSIONS 1:00 - 3:00

HEAD & NECK SESSION A - CROWN ROOM

Moderator:

Adam M. Zanation, MD, Chapel Hill, NC

1:00 Improved Functional Outcomes in Head and Neck Cancer Patients

with Identification of Primary Tumor Site

Sandhya Kalavacherla, BS, La Jolla, CA; Benjamin J. Bernard, MD, La Jolla, CA; Liza Blumenfeld, MA CCC-SLP, La Jolla, CA; Kristen Linnemeyer, MA CCC-SLP, La Jolla, CA; Theresa Guo, MD, La Jolla, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the potential impact of primary tumor site identification in patients who present with unknown primary head and neck squamous cell carcinoma.

Objectives: We characterize functional outcomes among patients with cancer of unknown primary (CUP) in the head and neck based on primary site identification. **Study Design:** Retrospective cohort study. **Methods:** CUP cases were categorized as known primaries (KP) if tumor was localized post-diagnostic workup or persisting unknown primaries (UP). Age, sex, HPV status, diagnostic workup, and treatments received were collected. Weights, and PHQ-8/9, Eating Assessment Tool (EAT-10), and Voice Handicap Index (VHI-10) scores were collected pre- and post-treatment. **Results:** Among 67 CUP patients, 35 (52.2%) had identified primaries; 91.4% were located in the oropharynx and 8.6% in the nasopharynx. KP patients were younger (60 vs. 65.2, $p=0.041$) and more likely to be HPV positive (88.6% vs. 50%, $p=0.002$). Overall detection rates were 16.7% for PET/CT, 34.7% for direct laryngoscopy, and 46.6% for transoral robotic oropharyngectomy. Differences in diagnostic workup and treatments were not significantly different, but UP received higher radiation doses (60.1 vs. 44.9 Gy, $p=0.03$). Pre-treatment weights, PHQ-8/9, EAT-10, and VHI-10 scores were similar. Post-treatment, UP had greater relative weight loss (-14% vs. -7.2%, $p=0.032$) and higher PHQ-8/9 scores (6 vs. 1.4, $p=0.017$). Post-treatment EAT-10 scores were also higher in UP (12.5 vs. 3, $p=0.004$). Specifically, UP reported more stressful swallowing (2 vs. 0, $p=0.010$), difficulty swallowing solids (2 vs. 0, $p=0.014$) and pills (1.5 vs. 0, $p=0.041$), and swallowing affecting eating out (1.5 vs. 0, $p=0.019$). VHI-10 scores did not differ post-treatment. **Conclusions:** In this retrospective series, UP patients experienced greater weight loss, depression, and swallowing dysfunction, highlighting a functional benefit of primary tumor identification.

1:05

Quantitative Analysis to Develop a Targeted Tobacco Cessation Program for Head and Neck Squamous Cell Cancer Patients from Rural Communities

Sarah Jeoung, BS, Rochester, NY; Nicole Mercer, Rochester, NY; Hannah Teets, Rochester, NY; Katherine K. S. Rieth, MD MPH MA, Rochester, NY

Educational Objective: At the conclusion of this presentation, the participants should have a better understanding of the communities in the rural area of our state and their needs for targeted intervention for tobacco associated head and neck squamous cell cancers

Objectives: To explore determinants of tobacco cessation in rural communities among HNSCC patients to develop a targeted cessation program. **Study Design:** This is a cross-sectional study assessing demographics, smoking history/habits, and viewpoints on cessation through an electronic survey. **Methods:**

Patients who meet eligibility criteria (at least 21 years old, HNSCC diagnosis, and smoking history) are recruited at a clinical visit. They completed the survey via a project device with a research staff member in a private space. This study and recruitment are currently ongoing. Interim analysis on current available data was performed using R and Microsoft Excel. Results: 26 surveys have been collected so far. 74% were male, 93% white, and average age was 65. The patients spanned 10 counties with 37% from rural counties. All patients smoked over 100 cigarettes in their lifetimes with most having a smoking history between 36 - 40 yrs (n=6). A higher percentage of patients currently smoking was from rural areas (60% vs 25%, p=0.037). Regarding smoking triggers, more patients from rural regions identified depression (60% vs 25%, p=0.037), anger (70% vs 31%, p=0.027), and being around smokers (90% vs 56%, p=0.035). More patients from rural areas identified being closer to home (80% vs 44%, p=0.034) as a facilitator to smoking cessation. They also identified coaching through texting (30% vs 6.25%, p=0.051) and smartphone app (50% vs 6.25%, p=0.005) as appealing methods. Conclusions: A free of charge and phone based smoking cessation program targeting population specific triggers may be more effective in lowering the rates of HNSCC in this underserved and high risk population.

1:10

The Effects of Gross Cranial Nerve Invasion on Oncologic Outcomes in Patients with HPV Related Oropharyngeal Squamous Cell Carcinoma

Agnes Q. Zhu, BS, Rochester, MN; Thomas Jamie O'Byrne, MAS, Rochester, MN; Travis J. Haller, MD, Rochester, MN; Eliot J. Martin, PA-C, Rochester, MN; Eric J. Moore, MD, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the impact gross cranial nerve invasion has on outcomes for HPV related oropharyngeal squamous cell carcinoma patients.

Objectives: This study examines oncologic outcomes in patients with HPV related oropharyngeal squamous cell carcinoma (HPV+)OPSCC) who had evidence of gross cranial nerve invasion (CNI) identified at the time of surgery. Study Design: Retrospective cohort study comparing demographics, clinical features, and outcomes of HPV+)OPSCC patients with and without gross CNI. Methods: Patients with biopsy proven HPV+)OPSCC involving the base of tongue, tonsil, or unknown primary site, who underwent surgery as a part of their treatment between 1/1/2006 - 12/31/2020 (n=874), were included in this study. Gross CNI was identified during operative intervention (n=36). Statistical analyses were performed using SAS version 9.4 and R version 3.6.2. P-values <0.05 were considered statistically significant. Results: HPV+)OPSCC patients with gross CNI were nearly 5 times as likely to suffer death by cancer (HR=5.41, 95% CI 2.51 to 11.67, p<0.0001), over 4 times as likely to see disease progression (HR=4.25, 95% CI 2.31 to 7.84, p<0.0001), and nearly 5 times as likely to experience metastasis (HR=4.46, 95% CI 2.20 to 9.06, p<0.0001) when compared to patients without CNI. Patients with gross CNI had significantly lower overall survival, cancer specific survival, progression free survival, and distant metastasis free survival (p<0.0001). Patients with gross CNI were significantly more likely to present with higher clinical N stage, higher pathological N stage and extracapsular spread than patients without gross CNI. Conclusions: Our findings indicate that the presence of CNI is associated with significantly poorer oncologic outcomes in HPV+)OPSCC patients.

1:15 Impact of Intraoperative Ischemia Time on Flap Related Complications in Microvascular Reconstruction -- A Systematic Review and Meta-Analysis

John W. Behnke, MD, Morgantown, WV; Patrick Sullivan, BS, Morgantown, WV; Erica Haught McArdle, MD, Morgantown, WV; William Stokes, MD, Morgantown, WV

Educational Objective: At the conclusion of this presentation, the participants should be able to articulate and discuss the proposed relationship between ischemia time and flap related complications in microvascular reconstruction.

Objectives: Our goal is to analyze the relationship between intraoperative ischemia time and flap related complications in microvascular reconstruction. Study Design: Systematic review and meta-analysis. Methods: A systematic review of intraoperative ischemia time and flap related complications was conducted using PRISMA guidelines. Exclusion criteria included studies unavailable in English or with less than 50 cases. After screening 3910 citations, four cohort studies and four case control studies were included in our final analysis. A random effects model was used to pool effect sizes for all studies. Results: In total, 4649 soft tissue and 214 osteocutaneous flaps with an overall 8% flap complication rate were analyzed. Most cases were DIEP flaps for breast reconstruction, with head and neck reconstruction constituting 13% of the cases. Two of the four case controls showed a significant association between flap related complications and ischemia time. Pooled analysis for case control studies showed ischemia time had a moderate effect on complications ($g=0.5$, p less than 0.0001). Three of four cohort studies showed an increased risk of flap related complications after 1-2 hours of ischemia time. Pooled analysis of cohort studies showed a relative risk of 2.00 for ischemia time greater than 1-2 hours ($p=0.035$). Conclusions: Our meta-analysis shows an association between flap related complications and increasing ischemia time, with a suggested critical period between 1.5 to 2 hours. While retrospective, this is the largest meta-analysis studying the relationship between ischemia time and flap related complications across all reconstructive literature. Further investigation is warranted with large, prospective studies powered for a rare outcome.

1:20 TRIOLOGICAL SOCIETY THESIS WITH DISTINCTION AWARD CD8+ and FoxP3+ T Cell Intercellular Distances Differ in HPV+ and HPV- HNSCC and Predict Response to Anti PD-L1 Checkpoint Inhibition

Joseph M. Curry, MD FACS, Philadelphia, PA

Educational Objective: To analyze the potential value of spatial distribution of key immune cells for assessing therapy with immune checkpoint inhibition in HNSCC.

Background: Spatial distribution of immune cells within the tumor microenvironment may have important implications for immune checkpoint inhibitor therapy. We sought to evaluate CD8+ and FoxP3+ T-cell cellular density (CD) and intercellular distances (ID) in head and neck squamous cell carcinoma (HNSCC) samples from a neoadjuvant trial of durvalumab +/- metformin. Methods: Paired pre- and post-treatment primary HNSCC tumor samples were stained for CD8+ and FoxP3+. Digital image analysis was used to determine estimated mean

CD8+ and FoxP3+ CD8+ and CD8+-FoxP3+ IDs in the leading tumor edge (LTE) and tumor adjacent stroma (TAS) stratified by treatment arm, human papillomavirus (HPV) status, and pathologic treatment response. A subset of samples was characterized for T-cell related signatures using digital spatial genomic profiling. Results: Post-treatment analysis revealed a significant decrease in FoxP3+ CD and an increase in CD8+ CD8+ in the TAS between patients receiving durvalumab and metformin versus durvalumab alone. Both treatment arms demonstrated significant post-treatment increases in ID. Although HPV+ and HPV- had similar immune cell CDs in the tumor microenvironment, HPV+ pre-treatment samples had 1.60 times greater ID compared with HPV- samples, trending toward significance ($p = 0.05$). At baseline, pathologic responders demonstrated a 1.16-fold greater CD8+ CDs in the LTE ($p = 0.045$) and 2.28-fold greater ID ($p = 0.001$) than non-responders. Digital spatial profiling revealed upregulation of FoxP3+ and cytotoxic T-lymphocyte-associated antigen 4 (CTLA-4) in the TAS ($p = 0.006$, $p = 0.026$) in samples from pathologic responders. Conclusions: Analysis of CD8+ and FoxP3+ detected population differences according to HPV status, pathologic response, and treatment. Greater CD8+-FoxP3+ ID was associated with pathologic response. CD8+ and FoxP3+ T-cell distributions may be predictive of response to immune checkpoint inhibition.

1:25 - 1:30

Q&A

Moderators:

Maie A. St. John, MD PhD FACS, Los Angeles, CA
Adam M. Zanation, MD, Chapel Hill, NC

1:30

Does Changing Location for Postoperative Radiotherapy Impact Survival in Salivary Gland Cancer?

Rushi Patel, BA, Newark, NJ; Christopher Tseng, MD, Newark, NJ;
 Soly Baredes, MD, Newark, NJ; Richard Park, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to identify whether patients should be encouraged to continue their postoperative radiation therapy at the same institution as primary surgical treatment.

Objectives: Changing location of postoperative radiotherapy (PORT) after surgical resection at high volume facilities (HVF) is associated with worse survival in various head and neck cancers. Our study aims to evaluate this relationship for patients with salivary gland cancer (SGC). Study Design: Retrospective database review. Methods: The 2004-2016 National Cancer Database was queried for all cases of adult SGC treated with surgery and PORT with or without adjuvant chemotherapy. Patients with multiple cancer diagnoses, metastatic disease, or with unknown location for receipt of PORT were excluded. Centers with higher than 95th percentile annual case volume were classified as HVF while the remainder were grouped as low volume facility (LVF). Results: A total of 7,885 patients met criteria, of which 418 (5.3%) were treated at HVF. Patients treated at HVF had higher rates clinical nodal positivity (18.2% vs. 14.0%, $p < 0.001$) and clinical T3/T4 (27.3% vs. 20.7%, $p = 0.001$) disease. Patients at HVF changed facility for PORT at lower rates (18.9% vs. 24.5%, $p = 0.009$). Patients treated at HVF had significantly higher 5 year overall survival (5 OS) (79.0% vs. 72.0%, $p = 0.042$). Patients treated at HVF that changed PORT facility had worse 5 OS

(60.8% vs. 83.2%, $p < 0.001$). Radiation facility change was an independent predictor of worse survival in HVF patients (OR: 2.904 [1.154-7.309], $p = 0.024$) but not those at LVF (OR: 0.998 [0.858-1.162], $p = 0.983$). Conclusions: Patients treated at HVF for SGC experience worse survival if they change facility for PORT. Our data suggests patients treated surgically at high volume centers should be counseled to continue their PORT at the same institution.

1:35 **Malignant Head and Neck Paraganglioma: A Comprehensive and Contemporary Review of a Rare Entity**

Avigeet Gupta, MD, Oklahoma City, OK; Kadie M. Nausha, MD, Oklahoma City, OK; Alexander G. Bien, MD, FACS, Oklahoma City, OK; Rachad I. Mhaweji, MD, Oklahoma City, OK

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the most updated and comprehensive data regarding the incidence, survival trends, and treatment modalities for malignant head and neck paragangliomas.

Objectives: There remains an overall paucity of literature regarding malignant head and neck paragangliomas (MHNPs) and optimal treatment strategies. Our study aims to elucidate contemporary trends regarding the incidence, management modalities, and predictors of survival in a rare entity of a malignancy for which there is no well established treatment guideline. To the best of our knowledge, this study contains the largest cohort and most updated data for patients treated within the largest national cancer database in the United States. **Study Design:** Retrospective review of the Surveillance, Epidemiology, and End Results (SEER) database. **Methods:** The Surveillance, Epidemiology, and End Results (SEER) database was queried for all cases of MHNPs from 2000 to 2019. **Results:** The age adjusted incidence of MHNPs has increased 56% from 2000 to 2019, (0.096 to 0.150 per 1,000,000). 142 patients were included for case listed statistical analysis, with the mean age at diagnosis being 47 years +/- 18.4, presence of regional disease in 47% of cases, and distant disease in 53%. Surgery was the most common form of treatment for MHNP (90, 63.4%) followed by radiation (57, 40.1%). 2 year and 5 year disease specific survival were noted to be 92% and 79%, respectively. Patients treated with surgery had a decreased risk of mortality (0.258, [95% CI 0.135 to 0.494], $P = 0.010$), whereas those with distant disease at diagnosis had an increased risk of mortality (3.47, [95% CI 1.780 to 6.800], $P < 0.001$). **Conclusions:** There was a statistically significant benefit for surgical management of MHNP. Distant metastasis at diagnosis was an independent predictor of increased mortality risk.

1:40 **Role of Circulating Tumor DNA in Head and Neck Cancer Surveillance**

Saudamini Lele, MD, Shreveport, LA; Landon Goodreau, BS, Shreveport, LA; Cherie Ann Nathan, MD, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the potential role of circulating tumor DNA as an adjunct to PET scans in head and neck cancer surveillance.

Objectives: Tobacco associated head neck squamous cell carcinomas (HNSCC) are aggressive cancers with a poor 5 year survival rate of approximately 25-60%. This study aimed to correlate the post-treatment PET-CT results with pres-

ence of ctDNA at 1 month and 3 month post treatment. Study Design: Retrospective review. Methods: This is a retrospective study including all patients with mucosal HNSCCs irrespective of stage who presented between July 2021 and January 2022 and had blood drawn for ctDNA at 1 and 3 months after definitive treatment and these results were compared to the post-treatment PET scans. Tumors were obtained for genomics at the time of diagnosis. Patients with thyroid, skin and salivary gland cancers were excluded. All patients with known distant metastasis or synchronous second primary cancers were also excluded. Results: 22 patients met the inclusion criteria. 5/22 patients were found to have ctDNA post-treatment. Of these 5 patients, 4 patients have clinical evidence of persistent disease with 3 having confirmed persistence. There was a statistically significant difference in disease free survival in the ctDNA positive and ctDNA negative groups ($p=0.03$). The positive predictive value of ctDNA was 80% compared to 42.8% for post-treatment PET scans. Conclusions: This study shows us that ctDNA could be an early marker of disease recurrence. Also, due to a better positive predictive value, ctDNA could be used as an adjunct in patients who have an equivocal post-PET scan.

1:45 **Evaluating Nodal Yield as a Predictor of Survival in HPV Positive Oropharyngeal Squamous Cell Carcinoma**

Austin C. Cao, BA, Philadelphia, PA; Kush Panara, MD, Philadelphia, PA; Neel Sangal, MD, Philadelphia, PA; Robert M. Brody, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should understand that the optimal cutoff for nodal yield in an adequate neck dissection may be different in oropharyngeal cancer compared to oral cavity cancer.

Objectives: Previous studies have suggested that nodal yield may be predictive of oncologic outcomes in HPV+ oropharyngeal squamous cell carcinoma (OPSCC). This literature has been limited by inconsistencies in surgical techniques and reliance on nodal yield cutoffs extrapolated from oral cavity cancer data. The primary objective of this study is to assess the optimal nodal yield of ipsilateral neck dissection (ND) and its prognostic value in HPV+ OPSCC. Study Design: Retrospective cohort study. Methods: Patients were identified who underwent ND as part of primary treatment of HPV+ OPSCC by a high volume surgeon that performs standardized ND of levels 1-4. Univariate Kaplan-Meier analysis, multivariate Cox proportional hazards regression analysis, and maximally selected rank statistics were used to determine optimal nodal yield cut points and associations with survival outcomes. Results: A total of 564 patients met the selection criteria [median age of 60 (IQR: 54-67), 87% male]. The median nodal yield for an ipsilateral ND was 41 (IQR: 33-50). With Cox proportional hazards modelling, the optimal cut point of nodal yield for both overall survival (OS) and disease free survival (DFS) was found to be 27 nodes when controlling for age, sex, smoking, clinical staging, margin status, lymphovascular invasion, extranodal extension, and adjuvant treatment. Patients with nodal yield less than 27 experienced significantly worse OS (HR: 0.48, 95% CI: 0.29-0.80, $p = 0.005$) and worse DFS (HR: 0.65, 95% CI: 0.43-0.99, $p = 0.044$). Conclusions: Nodal yield greater than or equal to 27 on ipsilateral ND of levels 1-4 is associated with improved survival outcomes for HPV+ OPSCC.

1:50 **Trends in Positive Surgical Margins in cT3-T4 Oral Cavity**

Squamous Cell Carcinoma

Kavita Prasad, BA, Nashville, TN; Michael C. Topf, MD, Nashville, TN; Stephanie Clookey, MS, Columbia, MO; Patrick Tassone, MD, Columbia, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss trends in positive surgical margin rates in surgically treated locally advanced oral cavity squamous cell carcinoma and factors associated with positive margins.

Objectives: Positive surgical margins in oral cavity squamous cell carcinoma (SCC) are associated with greater risk of recurrence, mortality, treatment intensification, and cost. The rate of positive margins has been decreasing for cT1-T2 oral cavity SCC over the past two decades. We aim to evaluate positive margin rates in cT3-T4 oral cavity SCC and determine factors associated with positive margins. **Study Design:** Retrospective analysis of the National Cancer Database. **Methods:** All adult patients diagnosed between 2004 and 2018 who underwent primary curative intent surgery for previously untreated cT3-T4 oral cavity SCC with known margin status were included. Logistic univariable and multivariable regression analyses were performed to identify factors associated with positive margins. **Results:** Among 16,326 patients with cT3 or cT4 oral cavity SCC, positive margins were documented in 2,932 patients (18.1%). Later year of treatment was not significantly associated with positive margins (OR 0.98, 95% CI 0.95-1.00). The proportion of patients treated at an academic center increased over the study period (OR 1.02, 95% CI 1.01-1.03). On multivariable analysis, positive margins were significantly associated with hard palate primary, cT4 tumors, advancing N stage, lymphovascular invasion, poorly differentiated histology, Medicare, Medicaid or other government insurance, and treatment at nonacademic or low volume centers. **Conclusions:** Despite an increase in treatment at academic centers for locally advanced oral cavity SCC, there has been no significant decrease in rates of positive margins which remain high at 18.1%. Novel techniques for margin planning and assessment or neoadjuvant approaches may be required to decrease the rate of positive surgical margins.

1:55 - 2:00**Q&A****2:00 - 2:55****PANEL****Changing Landscapes in Head & Neck Cutaneous Cancer****Moderator:**

Cecelia E. Schmalbach, MD MSc FACS, Philadelphia, PA

Panelists:

Carol R. Bradford, MD FACS, Columbus, OH

Gina D. Jefferson, MD FACS, Jackson, MS

Steven J. Wang, MD, Tucson AZ

2:55 - 3:00**Q&A****3:00 - 3:30****BREAK WITH EXHIBITORS - Ocean Ballroom**

THURSDAY CONCURRENT SESSIONS 1:00 - 3:00
OTOLOGY/NEUROTOLOGY SESSION B - CORONET ROOM

1:00 - 1:55

PANEL**Migraine Management for the Otolaryngologist****Moderator:**

Candace E. Hobson, MD, Atlanta, GA

Panelists:

Hamid R. Djalilian, MD, Irvine, CA

Michael B. Gluth, MD FACS, Chicago, IL

Stephanie A. Moody Antonio, MD FACS, Norfolk, VA

1:55 - 2:00

Q&A**Moderators:****Bruce J. Gantz, MD FACS, Iowa City, IA****Barry E. Hirsch, MD, Pittsburgh, PA**

2:00

Subjective Outcomes in Pediatric Cochlear Implant Users with Unilateral Hearing Loss

Kayla B. Hicks, MD, Chapel Hill, NC; Margaret T. Dillon, AuD PhD, Chapel Hill, NC; Kevin D. Brown, MD PhD, Chapel Hill, NC; Lisa R. Park, AuD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand outcome measures in cochlear implant users, and the different types of benefit that children can gain from cochlear implant usage in the setting of unilateral hearing loss.

Objectives: To assess the effect of cochlear implant (CI) use on subjective outcomes in children with unilateral hearing loss (UHL). **Study Design:** Prospective, longitudinal clinical trial. **Methods:** Eighteen children with moderate to profound UHL underwent cochlear implantation. The Pediatric Quality of Life Multidimensional Fatigue Scale (Peds-QL) and Speech Spatial and Qualities of Hearing Questionnaire modified for children (SSQ-C) were completed by parental proxy preoperatively and at 3, 6, 9, 12, 18, and 24 months post-activation. Linear mixed models evaluated changes over the study period. Pearson correlations assessed the association between subjective report, word recognition, and spatial hearing. **Results:** For the SSQ-C, parents reported significant improvements with CI use as compared to preoperative perceptions ($p < .001$); there was a trend towards continued improvement over the post-activation period ($p = 0.082$). This study was not sufficiently powered to detect differences in fatigue on the Peds-QL. For both measures, there was a significant effect of subscale ($p < .001$). Children experienced more difficulty with spatial hearing than speech understanding ($p < .001$) or sound quality ($p < .001$). Cognitive fatigue was more impactful than general ($p < .001$) or sleep fatigue ($p < .001$). Subjective reports, word recognition, and spatial hearing outcomes were not significantly correlated. **Conclusions:** Pediatric CI users with UHL maintain subjective benefit over time and are most impacted by cognitive fatigue and spatial hearing. Typical measures of CI performance (i.e., single word recognition) do not correlate with spatial hearing or subjective outcomes. These findings highlight the importance of spatial hearing evaluation and therapy for children with UHL.

2:05 The Role of Eustachian Tube Balloon Dilatation as Adjunct Procedure for Laser Myringoplasty Treatment of Tympanic Membrane Atelectasis

Maggie M. Mouzourakis, MD, Lebanon, NH; Emily G. Pengelly, BS MS, Lebanon, NH; James E. Saunders, MD MS, Lebanon, NH

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe current challenges in treating patients with tympanic membrane atelectasis and eustachian tube dysfunction; and 2) evaluate role of eustachian tube balloon dilatation and tympanostomy tube placement as adjunct procedures for patients undergoing laser myringoplasty for tympanic membrane atelectasis.

Objectives: Laser myringoplasty (LM) is a minimally invasive treatment of tympanic membrane (TM) atelectasis. A tympanostomy tube (TT) is generally placed during LM surgery to mitigate the effects of eustachian tube dysfunction (ETD) on the treated TM. However, TT can lead to further TM atrophy or perforation. Balloon dilatation of the eustachian tube (BDET) can reduce ETD, but there is limited research on BDET in patients undergoing middle ear surgery. We hypothesize that BDET will be equivalent or superior to TT for patients undergoing LM, reducing the need for additional surgeries. Study Design: Single institution retrospective cohort study. Methods: Clinical and audiometric data was collected on 34 adult ears with a median followup of 100 weeks undergoing LM with either BDET (10 ears), TT (14 ears), BDET and TT (5 ears), or LM alone (5 ears). Using chi square analysis, we compared air bone gap (ABG) closure and need for further procedures between LM/BDET and LM/TT groups. Results: There is no significant difference between the ears treated with BDET vs. TT alone at the time of LM. The majority (75%) of cases requiring tympanoplasty for perforation (n=3) had a TT placed at the time of LM. Only 10% of ears with LM/BDET required further surgery for ETD compared to 28.6% in the LM/TT group (p=0.27). Of the LM/BDET ears, 33.3% had closure of ABG contrasted with 0% in the LM/TT (p=0.097). Conclusions: BDET is a suitable alternative to TT in the LM treatment of TM atelectasis and may lead to fewer long term complications.

2:10 OtoMimix Bone Cement in Revision Stapedectomy: One Surgeon's Experience and Meta-Analysis

Patrick Barba, BA, La Jolla, CA; Jeffery Harris, MD PhD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the most common reasons for revision stapes surgery and the utility of hydroxyapatite (OtoMimix) bone cement in these procedures.

Objectives: This study's objective is to analyze the use of hydroxyapatite (OtoMimix) bone cement in revision stapes surgery. Study Design: Retrospective analysis of one surgeon's experience and meta-analysis. Methods: A retrospective chart review of all patients undergoing revision stapes surgery with one surgeon from 2007 to 2022 was performed. The pre and postoperative air bone gap (ABG) and pure tone average (PTA) was averaged at 0.5, 1, 2, and 3 kHz. Simultaneously, articles published on PubMed, Embase and Web of Science between 2000 to 2022 was queried with the search terms "revision", "stapes" or "stapedectomy", and "bone cement". Two assessors reviewed the results and reference lists of qualifying articles were cross referenced. Results: Nine pa-

tients qualified for inclusion in the retrospective study. There was improvement in air conduction pure tone averages after revision (55.1 dB vs 33.1 dB, $p = 0.01$). Overall, closure of the ABG within 20 decibels was observed in all nine cases (100%) and closure to within 10 dB was seen in seven patients (78%). In the meta-analysis, seven studies qualified for inclusion and reported on the results of 144 patients. ABG closure to within 10 dB was achieved in 70% (range 30-81.1%) of cases and closure to within 20 dB was shown in 89% (range 76.9-100%) of cases. Conclusions: Revision surgeries can be complex with issues ranging from the oval window up to the tympanic membrane. The availability of bone cement adds to the armamentarium of the surgeon to achieve success in these difficult cases.

2:15 **MRI Safety in Active Osseointegrated and Cochlear Implants: New Technology Creating Confusion over MRI Compatibility**

Griffin David Struyk, BS, Minneapolis, MN; Janet S. Choi, MD MPH, Minneapolis, MN; Meredith E. Adams, MD MS, Minneapolis, MN; Tina C. Huang, MD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand possible MRI induced complications with non-MRI compatible otologic implants, such as the Cochlear Osia, and the need for improved patient education and simplified radiology guidelines to prevent confusion over MRI compatibility.

Objectives: With the recent introduction of MRI compatible cochlear implants and a bone anchored hearing aid, there are greater opportunities for confusion regarding the MRI compatibility of legacy CIs and other osseointegrated devices, such as the Cochlear Osia. The objective of this study is to describe two cases where radiology approved MRIs for non-MRI compatible devices, resulting in complications. Study Design: Retrospective case series. Methods: Patient history, physical exam, operative reports, and imaging results were reviewed. Results: One patient with bilateral Cochlear Osia implants experienced dislocation of both internal magnets after 1.5 Tesla MRI, with left magnet inversion causing repulsion of the external magnet. The patient returned to the operating room for magnet replacement, where both magnets were found outside the device's silastic sheath, with the left magnet overturned consistent with physician exam and skull plain film findings. A second patient with a left sided legacy CI experienced similar internal magnet dislocation and inversion after 3 Tesla MRI. This was managed in the clinic by manually reseating the inverted magnet into the device pocket, followed by inverting the external magnet in the head coil. Conclusions: This case series describes MRI induced internal magnet dislocation and inversion with the Cochlear Osia and a legacy CI. There has been increasing confusion on MRI compatibility of implantable hearing devices among patients and radiologists. Our findings suggest the need for improved patient education on MRI compatibility and simplified radiology guidelines. The development of an MRI compatible Cochlear Osia would be advantageous, as patients frequently require MRI for various indications.

2:20 **TRIOLOGICAL SOCIETY THESIS HONORABLE MENTION FOR BASIC SCIENCE AWARD** **Magnetic Targeting of Gadolinium Contrast to Enhance Magnetic Resonance Imaging of the Inner Ear in an Endolymphatic Hydrops Mouse Model**

Trung N. Le, MD PhD, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to determine the effectiveness of local magnetic targeting delivery of gadolinium contrast to the inner ear for diagnosis of endolymphatic hydrops.

Objectives: 1. Determine the feasibility and efficiency of local magnetic targeting delivery of gadolinium (Gad) contrast to the inner ear in rodent. 2. Assess any potential ototoxicity of magnetic targeting delivery of Gad in the inner ear. 3. Study the utility of magnetic targeting delivery of Gad to visualize and quantify endolymphatic hydrops (EH) in a transgenic mouse model. Study Design: Controlled *in vivo* animal model study. Methods: Paramagnetic Gad was locally delivered to the inner ear using magnetic targeting technique in both rat and mouse models. Efficiency of contrast delivery was assessed using magnetic resonance imaging (MRI). Ototoxicity of Gad was examined with histology of the cochlea and functional audiological tests. The Phex mouse model was used to study EH, hearing loss, and balance dysfunction. Magnetic targeting delivery of Gad contrast was used in the Phex mouse model to visualize the effects of EH using MRI. Results: Magnetic targeting improved delivery of Gad to the inner ear and the technique was reproducible in both rat and mouse models. The delivery method did not result in microstructural damage or any significant hearing loss in normal animal. Magnetic targeting of Gad in the Phex mouse model allowed detailed visualization and quantification of EH. Conclusions: This study provided the first evidence of effectiveness and efficiency of the local magnetic targeting delivery of gadolinium contrast to the inner ear and its application to visualization and quantification of EH.

2:25 - 2:30

Q&A

Moderators:

Jacques H. Herzog, MD, Chesterfield, MO

Mia E. Miller, MD, Los Angeles, CA

2:30

Postoperative Opioid Prescribing Patterns following Lateral Skull Base Spontaneous Cerebrospinal Fluid Leak Repair

Allie Morgan Ottinger, BS, Charleston, SC; Mallory J. Raymond, MD, Jacksonville, FL; Emma Marin Miller, BS, Charleston, SC; Ted A. Meyer, MD PhD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the current opioid prescribing patterns following surgical repair of lateral skull base cerebrospinal fluid leaks; 2) recognize that postoperative opioid requirements might differ based upon operative approach and comorbid conditions; and 3) identify that patients rarely request additional opioids and conservative dosing should be used when prescribing at discharge.

Objectives: To characterize the opioid prescribing patterns for and requirements of patients undergoing repair of spontaneous cerebrospinal fluid (sCSF) leaks of the lateral skull base. Study Design: Retrospective chart review. Methods: A retrospective chart review of lateral skull base sCSF leak repairs between September 1, 2014, and December 31, 2020 was performed. Outcome measures included mean morphine equivalents (MME) of opioids dispensed to inpatients

and prescribed at discharge, additional pain control medications dispensed, and outpatient additional opioid requests. Results: Of 78 patients, 46 (59%) underwent repair via transmastoid (TM), 6 (7.7%) via middle cranial fossa (MCF), and 26 (33.3%) via combined TM-MCF approaches. Inpatients received 21.3, 31.4 and 37.6 mean MME per day for the TM, MCF, and TM-MCF approaches, respectively ($p=0.02$). Upon discharge, nearly all patients ($n = 74$, 94.9%) received opioids; 27.3, 32.5, and 37.6 MME per day were prescribed after the TM, MCF, and TM-MCF approaches, respectively ($p = 0.02$). Five (6.4%) patients requested additional outpatient pain medication, after which 3 were prescribed 36.7 MME per day. Patients with idiopathic intracranial hypertension required significantly more inpatient MME (41.5 versus 25.2, $p = 0.02$), as did patients with history of headache (39.6 versus 23.6, $p=0.042$). Conclusions: Patients undergoing sCSF leak repair via the MCF or TM-MCF approaches are prescribed more opioids postoperatively than patients undergoing the TM approach. The low rate of additional opioids requested after discharge suggests that the prescribing practices assessed in this study were sufficient. Patients with a history of headaches or idiopathic intracranial hypertension might require more opioids postoperatively.

2:35

Quantitative Vestibular Assessment: The Development and Validation of a Novel, Remote Video Head Impulse Test Against In-Clinic Measurements

Raymond J. So, AB, Baltimore, MD; Ashley Cevallos, BS, Baltimore, MD; Macie Pile, BA, Baltimore, MD; Kevin Biju, MS, Baltimore, MD; Michael C. Schubert, PhD, Baltimore, MD; Yuri Agrawal, MD MPH, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to understand and implement a remote, Zoom based version of the video head impulse test. We hope to educate attendees on the increasing importance of remote, point of care diagnostic technologies, particularly for patients with vestibular deficits.

Objectives: Vestibular hypofunction may be quantified using the video head impulse test (vHIT) but ambulating to outpatient clinics may be difficult and preclude assessment for this patient population. This study's objective was to develop and validate a novel, remote vHIT (rHIT). **Study Design:** Cross-sectional study. **Methods:** Six patients referred for vestibular assessment at our institution were recruited. In-clinic vHIT was used to quantify lateral vestibular-ocular reflex (VOR) gains. Patients subsequently underwent an rHIT protocol, whereby patients performed active, lateral head rotations while their eyes and heads were recorded using a laptop camera and Zoom software. Frame by frame positions and velocities of patients' eyes and heads were manually tracked and calculated using the open source Tracker software. The vHIT and rHIT VOR gains were compared using paired t tests, and correlation between the gains was calculated. Receiver operating characteristic (ROC) and area under the curve (AUC) analyses were performed to identify the optimal rHIT diagnostic threshold. **Results:** Of the six patients recruited, four were male, and the average (\pm SD) age was 67.5 \pm 12.7 years. Diagnosed using vHIT, one patient had normal vestibular function, four exhibited unilateral hypofunction, and one demonstrated bilateral hypofunction. vHIT and rHIT gains exhibited a correlation of 0.86, and were not significantly different ($p=0.10$). An ROC AUC analysis identified an optimal diagnostic gain threshold of 0.90 for the rHIT, which subsequently yielded

100% sensitivity, specificity, accuracy, and ROC AUC score. Conclusions: The novel rHIT closely approximates VOR gains calculated by the in-clinic vHIT, and demonstrates high sensitivity, specificity, and accuracy. This remote protocol may help expand point of care quantitative vestibular assessment.

2:40 **Utility of Extended High Frequency Audiograms in Clinical Practice: A Case Series**

Mia Saade, BS, New York, NY; Karla Fernandez, AuD CCC-A, New York, NY; Zachary G. Schwam, MD, New York, NY; Christine Little, BA, New York, NY; Maura Cosetti, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the utility of extended high frequency testing within the clinical setting.

Objectives: Extended high frequency (EHF) audiometry elicits pure tone thresholds at frequencies above 8 kHz, which are not included in routine clinical testing. This study explored the utility of EHF audiometry in patients with various audiological complaints despite normal hearing thresholds at less than 8 kHz. Study Design: Retrospective case series. Methods: Patients with audiological complaints, pure tone thresholds less than 25 dB HL bilaterally on routine testing (250 kHz - 8 kHz), and at least one pure tone threshold greater than 25 dB HL on EHF audiometry (9 kHz - 20 kHz) were included. EHF pure tone average (EHFA) was defined for each ear as an average of the thresholds at 9, 10, 11.25, 12.5, 14.25, 16, 18, and 20 kHz. Demographic and medical history were reviewed and analyzed. Results: 20 patients (average age 46 years, range 25-66; 6 men, 14 women) were identified. Audiological complaints included tinnitus (n=14), subjective hearing loss (n=13), aural fullness (n=5), hyperacusis (n=4), and otalgia (n=2). The average EHFA was 32.0 dB HL (range 10-55.6, SD 13.6). The average frequency of maximum hearing loss was 14.4 kHz (range 9-18, SD 2.1). Seven patients reported prior noise exposure and had a higher average EHFA compared to the remaining patients (36.7 vs 29.2 dB HL). Conclusions: EHF testing correlates with audiological symptoms in patients with normal testing at less than 8 kHz and should be considered when standard audiometry is normal. Additional data is warranted to create an evidenced based, clinical algorithm for EHF audiometry that can guide treatment, direct mitigation strategies, and potentially identify those at higher risk of hearing loss over time.

2:45 **The Role of Selective Serotonin Reuptake Inhibitors and Tricyclic Antidepressants in Addressing Reduction of Meniere's Disease Burden**

Mana Sheykholtan, BS, Washington, DC; Alexander Amit Missner, BS, Washington, DC; Amir Aaron Hakimi, MD, Washington, DC; Michael Hoa, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the potential role of selective serotonin reuptake inhibitors and tricyclic antidepressants in reducing disease burden in Meniere's disease.

Objectives: To assess the effect of selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants (TCAs) in reduction of vertigo, tinnitus, and

hearing loss among patients with Meniere's disease (MD). Study Design: Narrative literature review. Methods: Studies were identified through the following search phrases: "serotonin specific reuptake inhibitors" OR "tricyclic antidepressants" AND "Meniere's disease" in these databases: Ovid Medline, PubMed-NCBI, CINAHL, Cochrane Library, Web of Science, and Clinicaltrials.gov. References from included studies were examined for possible inclusion of additional studies. Results: Literature search yielded 23 results, which were screened by three independent reviewers. 17 studies and three duplicates were excluded if patients did not have MD or if interventions were not TCAs/SSRIs. An examination of references from included studies yielded two additional publications. Five published studies assessing SSRIs and TCAs among a total of 233 MD patients were ultimately included. Four studies described significant reduction in vertigo attack frequency among patients treated with either SSRIs or TCAs. Three studies assessed the drugs' effects on hearing, of which none found a significant difference among patients treated with SSRIs or TCAs. One study found a significant decrease in patient reported tinnitus following treatment with TCAs or SSRIs. Conclusions: Data exploring SSRIs and TCAs among patients with MD suggests that they may reduce tinnitus and vertigo, although there was significant heterogeneity in outcome reporting. There remains a need to study these treatments in MD patients in larger scale prospective studies that emphasize objective data to evaluate their effectiveness in reducing common MD symptoms including hearing fluctuation or loss.

2:50

TRIOLOGICAL SOCIETY THESIS WITH DISTIINCTION AWARD
The Impact of Vocal Boost Manipulations on Musical Sound for Cochlear Implant Users

Charles J. Limb, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, participants should be able to understand the benefits and drawbacks of vocal boost manipulations on perceived musical sound quality for cochlear implant users.

Objective: At the conclusion of this presentation, the participants should be able to evaluate the impact of vocal boost manipulations on cochlear implant (CI) musical sound quality appraisals. Methods: An anonymous, online study was distributed to 33 CI users. Participants listened to auditory tokens and assessed the musical quality of acoustic stimuli with vocal boosting and attenuation using a validated sound quality rating scale. Four versions of real-world musical stimuli were created: a version with +9 dB vocal boost, a version with -9 dB vocal attenuation, a composite stimulus containing a 1,000 Hz low-pass filter and white noise ("anchor"), and an unaltered version ("hidden reference"). Subjects listened to all four versions and provided ratings based on a 100-point scale that reflected the perceived sound quality difference of the music clip relative to the reference excerpt. Results: Vocal boost increased musical sound quality ratings relative to the reference clip (11.7; 95% CI, 1.62-21.8, $p = 0.016$) and vocal attenuation decreased musical sound quality ratings relative to the reference clip (28.5; 95% CI, 18.64-38.44, $p < 0.001$). When comparing the non-musical training group and musical training group, there was a significant difference in musical sound quality rating scores for the vocal boost condition (21.2; 95% CI: 1.76-40.7, $p = 0.028$). Conclusions: CI-mediated musical sound quality appraisals are impacted by vocal boost and attenuation. Musically trained CI users report greater musical sound quality enhancement with vocal boost with respect to CI users with no musical training background. Implementation of front-end vocal

boost manipulations in music may improve sound quality and music appreciation among CI users.

2:55 - 3:00 Q&A

3:00 - 3:30 BREAK WITH EXHIBITORS - Ocean Ballroom

**THURSDAY CONCURRENT SESSIONS 3:30 - 5:30
RHINOLOGY/ALLERGY SESSION C - CROWN ROOM**

Moderators:

Edward C. Kuan, MD MBA, Irvine, CA

Brent A. Senior, MD, Chapel Hill, NC

3:30 The Burden of Migraine on Quality of Life in Chronic Rhinosinusitis

Armo Derbarsegian, BS, Cincinnati, OH; Sarah M. Adams, BS, Cincinnati, OH; Katie M. Phillips, MD, Cincinnati, OH; Ahmad R. Sedaghat, MD PhD, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the contribution of migraine to CRS disease burden; and 2) describe clinical signs and symptoms that may indicate a higher likelihood of migraine complicating a patient's CRS.

Objectives: To determine the impact of comorbid migraine on quality of life (QOL) in chronic rhinosinusitis (CRS). Study Design: Prospective cross-sectional. Methods: A total of 213 adult patients with CRS were recruited. All participants completed a 22 item Sinonasal Outcome Test (SNOT-22), from which total and validated nasal, ear/facial pain, sleep and emotional subdomain scores were calculated, and the 5 dimension EuroQol general health questionnaire (EQ-5D) from which the visual analogue scale (VAS) and health utility value (HUV) were calculated. The presence of comorbid migraine was determined by a score of ≥ 4 on the 5 item Migraine Screen Questionnaire (MS-Q). Results: Of participants, 36.2% were screened positive for having comorbid migraine. The mean SNOT-22 score was 64.9 (SD: 18.7) in participants with migraine and 41.5 (SD: 21.1) in participants without migraine ($p < 0.001$). The mean EQ-5D VAS and HUV were 60.2 (SD: 21.9) and 0.69 (SD: 0.18), respectively, in participants with migraine and 71.4 (SD: 19.4) and 0.84 (SD: 0.13), respectively in participants without migraine ($p < 0.001$ for both). Higher ear/facial pain (OR=1.22, 95% CI: 1.10 - 1.36, $p < 0.001$) and sleep (OR=1.11, 95% CI: 1.04 - 1.18, $p = 0.002$) SNOT-22 subdomain scores were positively associated with migraine. The SNOT-22 item scores related to dizziness, reduced concentration, and facial pain, in descending order, were most associated with migraine. Presence of nasal polyps (OR=0.24, 95% CI: 0.07 - 0.80, $p = 0.020$) was negatively associated with migraine. Conclusions: Comorbid migraine may be relatively common amongst CRS patients and its presence is associated with significantly worse QOL. Dizziness as a symptom in CRS patients may be particularly indicative of migraine.

3:35 Parameter Combinations for Best Olfactory Intranasal Drug Delivery across Different Nasal Vestibule Morphologies

Ryan Michael Sicard, BS, New York, NY; Madison G. Chait, BS, Durham, NC; Sylvie A. Mason, BS, Durham, NC; Dennis Oyeka Frank-Ito, PhD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how drug particle release parameters and patient positioning affect the efficacy of drug delivery to the olfactory bulb and cleft for use in nose to brain drug delivery and treatment of olfactory stenosis, respectively.

Objectives: The nose is a viable pathway for olfactory drug delivery for smell loss treatment and nose to brain delivery. This study investigates how nasal variations and intranasal delivery parameters affect drugs to the olfactory cleft (OF) and bulb (OFB). **Study Design:** Computational study using extensive parametrical optimization modeling in three healthy subjects with normal nasal anatomy. **Methods:** Computational fluid dynamics simulated drug transport to the OF and OFB in three healthy adult subjects. The nasal vestibule phenotype of subject 1 was elongated, 2's was notched, and 3's was standard. To assess best OF and OFB deposition, simulations were done for 6 flowrates mimicking resting to sniffing (10-50L/min), 5 spray release locations (top, bottom, central, lateral, and medial), 5 head positions (upright, tilted forward, tilted back, supine, and Mygind), and 3 particle velocities (1, 5, and 10m/s). 350,000 micronparticles (1-100 μ m) and 346,500 nanoparticles (10-990nm) were released. **Results:** Best OF depositions were 28.37% (left)-75.35% (right) with particles 6-10 μ m at 30L/min sprayed via top at 1m/s in Mygind's position (subject 1), 16.85% (left)-45.31% (right) for 30-40nm particles at 20L/min via medial at 1m/s in the supine position (subject 2), and 15.89% (right)-29.11% (left) for 21-20 μ m particles at 10L/Min via medial at 1m/s in the upright position (subject 3). Best OFB depositions were 6.49% (left)-26.36% (right) for 11-20 μ m particles at 10L/min via top at 1m/s in Mygind's position (subject 1), 2.57% (right)-3.63% (left) for 1-5 μ m particles at 50L/min via lateral at 5m/s in the tilted forward position (subject 2), and 1.75% (right)-2.79% (left) for 21-30 μ m particles at 15L/min via top in Mygind's position (subject 3). **Conclusions:** Micron particles had better OFB deposition and usually more OF deposition. Smaller, slower micron particles generally had better deposition.

3:40 Bleeding Risk from Nonsteroidal Anti-Inflammatory Drugs after Functional Endoscopic Sinus Surgery - Analysis of the TriNetX Database

Mandy K. Salmon, BS, Philadelphia, PA; Jacob G. Eide, MD, Philadelphia, PA; Rijul S. Kshirsagar, MD, Philadelphia, PA; James N. Palmer, MD, Philadelphia, PA; Nithin D. Adappa, MD, Philadelphia, PA; Michael A. Kohanski, MD PhD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the risk of bleeding after endoscopic sinus surgery for patients prescribed nonsteroidal anti-inflammatory medications versus opioid medications, and to understand the bleeding risk of patients who were unable to hold aspirin at time of surgery.

Objectives: Postoperative pain medications and aspirin prior to undergoing functional endoscopic sinus surgery (FESS) are managed carefully due to concern

for bleeding. We compared outcomes for patients undergoing FESS who were managed postoperatively with nonsteroidal anti-inflammatory drugs (NSAIDs) versus opioids. We also determined epistaxis rate for patients on aspirin at time of surgery compared to those who were not on aspirin. Study Design: Retrospective analysis of patients undergoing FESS using the TriNetX database. Methods: Patients were propensity matched, and odds of bleeding complications between the patients prescribed postoperative NSAIDs were compared to those prescribed opioids. We also compared postoperative odds of bleeding in patients unable to halt aspirin use at time of surgery to those who were not on aspirin prior to surgery. Results: 51,361 patients received opioids after FESS compared to 1,923 patients who received NSAIDs. After propensity matching, odds of epistaxis were similar between the NSAID group and the opioid group (OR: 1.32 95% CI: 0.90, 1.94). 7.67% of the NSAID group required rescue opioids. Patients on aspirin who were unable to hold aspirin at surgery showed bleeding rates of 14.67% compared to 9.00% in propensity matched controls who were not on aspirin (OR: 1.74 95% CI: 1.20-2.51). Conclusions: NSAID use appears to be a safe alternative to opioids for patients without preexisting risk factors for bleeding. Patients who remained on aspirin in the week prior to FESS had an increased risk of postoperative epistaxis.

3:45 **Efficacy of Steroid Eluting Implants in Frontal Sinus Outflow Tract Patency at 1 Year after ESS**

Tejesh Guddanti, BS, Oklahoma City, OK; Edward El Rassi, MD, Oklahoma City, OK

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the efficacy of steroid eluting stents 1 year after ESS on frontal sinus outflow tracts

Objectives: Endoscopic sinus surgery (ESS) is often performed for patients with medically refractory chronic rhinosinusitis (CRS). The use of drug eluting stents place has been associated with improved short term outcomes after ESS. This study aims to assess outcomes of drug eluting stents in frontal sinus outflow tract patency at 1 year after ESS. Study Design: Retrospective analysis. Methods: A retrospective analysis was performed on patients with CRS who underwent ESS in 2020. Patients were included if they underwent a frontal sinusotomy and had at least 1 year of followup data for analysis. Patients who received ESS with the primary indication other than CRS and patients who underwent a Draf I or balloon sinuplasty were excluded. Results: A total of 47 patients were available for analysis with a total of 46 frontal sinuses that did not receive implants and 36 frontal sinuses that did receive implants. At 1 year, no statistically significant difference was seen in patency between frontal sinuses that received implants and frontal sinuses that did not (94.4% vs 100%, $p=0.19$). Grade 2 (moderate-severe) edema was more common in frontal sinuses that received implants (17.4% vs 5.6%, $p<0.001$). Sinonasal crusting beyond 6 weeks post-ESS was also more common in the group who received an implant (32.6% vs 13.9%, $p<0.001$). Subset analysis of patients with CRSwNP showed similar rates of patency in frontal sinuses that received implants compared to those that did not (93.33% vs 100%, $p=0.293$). Lund-McKay scores were included to measure baseline disease severity for each patient. Conclusions: The use of drug eluting stents did not have any effect on frontal sinus patency at 1 year post-ESS. Further study is needed to validate findings as well as to determine specific criteria for when the use of a drug eluting stent may have benefit or lack thereof.

3:50 **Induction Chemotherapy for Locoregionally Advanced Sinonasal Squamous Cell Carcinoma: A Population Based Analysis**

Arash Abiri, BS, Irvine, CA; Theodore V. Nguyen, BS, Irvine, CA; Jonathan Pang, BA, Irvine, CA; Khodayar Goshtasbi, MD, Irvine, CA; Sina J. Torabi, MD, Irvine, CA; Edward C. Kuan, MD MBA, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of induction chemotherapy in definitive management of locoregionally advanced sinonasal squamous cell carcinoma.

Objectives: There is emerging evidence to suggest the role of induction chemotherapy (IC) in definitive management of locoregionally advanced sinonasal squamous cell carcinoma (SNSCC). We evaluated the influence of IC on survival and predictors of its use in SNSCC patients. **Study Design:** Retrospective database study. **Methods:** The 2004-2017 National Cancer Database was queried for patients with locoregionally advanced SNSCC (T4/M0). Treatments were stratified into 7 groups: definitive chemoradiation (CRT), IC with definitive CRT (IC+CRT), IC+CRT with salvage surgery (IC+CRT+Sx), definitive surgery (Sx), IC with definitive surgery (IC+Sx), definitive surgery with adjuvant radiation or CRT (Sx+ATx), or IC+Sx+ATx. Cox proportional hazards regression assessed overall survival (OS) and logistic regression identified predictors of IC. **Results:** Of 4779 patients, 1538 (32.2%) were female with a mean age of 61.0 +/- 13.8 years. The 2 and 5 year OS rates were 60.6% and 44.3%, respectively. Compared to CRT, Sx+ATx (hazard ratio [HR]: 0.754; p<0.001), IC+Sx (HR: 0.678; p=0.021), or IC+Sx+ATx (HR: 0.561; p=0.012) exhibited reduced mortality. Among patients who were treated with definitive surgery, those receiving IC had additional OS benefit (all p<0.05). Older age (odds ratio [OR]: 0.685; p<0.001), female sex (OR: 0.764; p=0.004), black race (OR: 1.591; p<0.001, T4b stage (OR: 1.467; p<0.001), and higher N stage (OR: 1.241; p<0.001) were predictors of IC. **Conclusions:** IC prior to definitive surgery with or without adjuvant therapy exhibited the highest OS for locoregionally advanced SNSCC. Age, sex, race, and T/N staging were predictors of IC. Multimodal treatment regimens involving surgery as the primary modality may, therefore, provide the greatest therapeutic response.

3:55 - 4:00 **Q&A**

Moderators:

Stacey T. Gray, MD FACS, Boston, MA
Hassan H. Ramadan, MD FACS, Morgantown, WV

4:00 **Gender Differences in Adolescent Patients with Chronic Sinonasal Symptoms**

Caroline Marie Dundervill, BS, Morgantown, WV; John Behnke, MD, Morgantown, WV; Parker Tumlin, MD, Morgantown, WV; Rafka Chaiban, MD, Uniontown, WV; Hassan H. Ramadan, MD MSc, Morgantown, WV; Chadi A. Makary, MD, Morgantown, WV

Educational Objective: At the conclusion of this presentation, the participants should be able to compare subjective disease burden between male and female adolescent patients with chronic sinonasal symptoms and apply this understand-

ing to further research regarding personalized treatment decision making.

Objectives: To identify differences between male and female adolescent patients with chronic sinonasal symptoms in baseline disease severity at presentation and choice for surgery vs continued medical treatment. **Study Design:** Retrospective cohort study. **Methods:** Adolescent patients, ages 12 to 18 years old, presenting to our otolaryngology clinic between August 2020 and June 2022 for chronic rhinosinusitis (CRS), recurrent acute rhinosinusitis (RARS), and nasal obstruction (NO) were asked to fill both the SNOT-22 and the SN5 forms. **Demographics,** comorbidities, subjective and objective disease measurements, and choice of medical vs surgical therapy were compared between male and female cohorts. **Results:** 123 patients were included. Average age was 15 years, and 48.8% were female. There were no differences in age, allergic rhinitis, asthma, obstructive sleep apnea, presence of nasal septal deviation, or diagnosis categories between female and male patients (p greater than 0.05 for all). At presentation, mean overall SNOT-22 and psychological domain were significantly higher in female patients (34 vs 26, $p=0.04$; and 11.4 vs 7.7, $p=0.03$ respectively). SN5 scores also tended to be higher in females (3.4 vs 3, $p=0.08$). When performed, Lund-Kennedy endoscopy scores and CT Lund-Mackay scores tended to be higher in males (1.3 vs 0.7, $p=0.06$; 5.8 vs 3, $p=0.27$ respectively). There were no gender differences in the choice of medical vs surgical treatment. **Conclusions:** Female patients with chronic sinonasal symptoms show higher subjective disease burden. Incorporating data on gender specific differences may be important to personalize treatment decision making.

4:05 **The Impact of Gender on Long Term Quality of Life after Sinus Surgery for Chronic Rhinosinusitis**

Dara R. Adams, MD, Boston, MA; Lucy J. Xu, MD, Boston, MA; Thad W. Vickery, MD, Boston, MA; George A. Scangas, MD, Boston, MA; Stacey T. Gray, MD, Boston, MA; Ralph Metson, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe differences in quality of life between female and male patients who undergo surgery for chronic rhinosinusitis.

Objectives: To identify the impact of gender on clinical outcomes of endoscopic sinus surgery (ESS) through the comparison of quality of life (QOL) measures in female and male patients who undergo surgical treatment for chronic rhinosinusitis (CRS). **Study Design:** Prospective observational cohort study. **Methods:** Patients with CRS completed the 22 item Sino-Nasal Outcome Test (SNOT-22) and the EuroQol 5 Dimension survey (EQ-5D) preoperatively and annually for five years following ESS. Health utility values (HUVs) were calculated from EQ-5D scores. Comparisons of SNOT-22 and HUV scores by gender were performed with t tests and linear regression. **Results:** Among 1260 patients (54% female) enrolled at baseline, 802 (64%) and 344 (27%) completed postoperative surveys at one and five years, respectively. Preoperatively, females experienced worse mean SNOT-22 scores (51.0 +/- 20.9 female vs. 44.5 +/- 19.8 male, $p < 0.001$) and HUVs (0.80 +/- 0.14 female vs. 0.84 +/- 0.11 male, $p < 0.001$). One year postoperatively, these gender differences had resolved for both SNOT-22 ($p=0.170$) and HUVs ($p=0.698$). Five years after surgery, however, worse QOL scores were reported by females for both outcome measures (SNOT-22: 26.9 +/- 19.7 female vs. 22.9 +/- 17.4 male, $p=0.046$; HUV 0.85 +/- 0.12 female, 0.88 +/- 0.11 male, $p=0.017$). These gender related differences persisted when controlling for the

presence of nasal polyps, history of prior ESS, and smoking status ($p < 0.001$). Conclusions: Females with CRS reported worse health related QOL both before and five years after surgery than their male counterparts. Understanding the mechanism behind these gender related differences is important to optimize treatment of patients with CRS.

4:10 **Evaluation of Narrow Band Imaging (NBI) in the Diagnosis of Sinonasal Inverted Papilloma**

Liliya Benchetrit, MD, Boston, MA; Evan Thomson, BS, Boston, MA; Marianella Paz-Lansberg, MD, Boston, MA; Christopher Brook, MD, Boston, MA; Michael Platt, MD MSc, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the existence of different appearances of sinonasal vascularity that can be seen by narrow band imaging (NBI), and differentiate three different NBI vascular patterns correlating to normal sinonasal mucosa, inflammatory sinonasal polyp, and sinonasal inverted papilloma.

Objectives: Narrow band imaging (NBI) has been applied in the differentiation between benign and malignant laryngeal and oral cavity lesions. We aimed to investigate the diagnostic value of NBI in differentiating sinonasal inverted papilloma from inflammatory polyps and suggest a classification schema for future use. Study Design: Retrospective study. Methods: Analysis of 45 consecutive patients with sinonasal polyps and 10 controls (69 total nasal cavities) between March 2017 and July 2022 was conducted. White light endoscopy (WLE) and NBI exams were performed prior to surgical excision. A classification schema according to microvascular patterns was devised after review of NBI recordings. Three senior authors blinded to the final surgical pathologic diagnosis reviewed all WLE and NBI videos and rated the lesions according to the classification schema. Diagnostic efficacies of WLE and NBI were compared with final pathologic diagnoses. Results: Three patterns of microvascular appearance on NBI were generated. Normal mucosa had small, thin vascular lines interspersed among dotted spots (type 1, $n=10$). Inflammatory polyps had thin septate vessels (type 2, $n=59$). Inverted papilloma had elongated, tortuous and congested vascularity (type 3, $n=10$). There was a trend of higher sensitivity (76.6% vs 63.3%), NPV (96.0% vs 93.7%), PPV (69.6% vs 60.5%) and accuracy (90.4% vs 85.3%), but not specificity (92.7% vs 91.5%), of NBI as compared to WLE in identifying sinonasal inverted papilloma. Conclusions: NBI can be an important adjunct in the clinical differentiation of sinonasal inverted papilloma from inflammatory polyps, however larger scale studies are required.

4:15 **Comparing Short Term Outcomes of Chronic Rhinosinusitis Patients with Polyps between Hispanic and Non-Hispanic Patient Populations: A Pilot Study**

Laila Siddique, MD, Miami, FL; Corinna Levine, MD MPH, Miami, FL; Christine Dinh, MD, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to identify differences in disease specific quality of life and measures of disease burden between patient populations with the same clinical disease.

Objectives: 1) Evaluate preoperative QOL, smell, and disease severity between Hispanic and non-Hispanic patients; 2) evaluate short term postoperative change in QOL, smell, and disease severity between Hispanic and non-Hispanic patients; and 3) exploratory: determine difference in cytokine expression profile between Hispanic and non-Hispanic patients. Study Design: A prospective cohort study was performed on 20 Hispanic and 20 non-Hispanic, age and sex matched CRS patients with nasal polyps, undergoing primary sinus surgery. Methods: Pre and postoperative Sino-Nasal Outcome Test-22 (SNOT-22), smell, disease severity, demographics, and covariates were collected. Descriptive statistics were performed using Mann-Whitney-U test. A subset of 14 patients had sinonasal tissue collected during surgery and processed for cytokine analysis. Results: Each cohort is 30% female with similar baseline radiographic and endoscopic disease severity. The preoperative SNOT-22 was significantly worse in the Hispanic cohort, objective smell function was worse in the Hispanic cohort but did not reach statistical significance. Three months postoperatively, both cohorts had similar smell and endoscopic disease outcomes. The SNOT-22 improved in both cohorts with a trend toward a greater improvement in non-Hispanics. In the exploratory cytokine analysis, the non-Hispanic patients exhibit more expression of selected cytokines than the Hispanic group. Conclusions: Hispanic patients have worse pre and postoperative SNOT-22 scores despite similar disease severity and smell function measures. However, in our exploratory analysis Hispanics express more cytokine than their non-Hispanic counterparts. This trend has significant clinical implications and deserves further investigation.

4:20 **Sniffing out the Association between Olfactory Impairment and Balance Dysfunction**

Lekha V. Yesanatharao, BS, Baltimore, MD; Varun Vohra, BA, Baltimore, MD; Michael Cheng, MD, Baltimore, MD; Yuri Agrawal, MD MPH, Baltimore, MD; Sascha du Lac, PhD, Baltimore, MD; Nicholas Rowan, MD, Baltimore, MD

Educational Objective: Increasing evidence suggests an unexpected relationship between olfaction and cerebellar function. With the use of olfactory assessment in a robust population level dataset and proprioceptive assessment through balance testing in the Healthy Brain Project subset of the Health, Aging and Body Composition Study (Health ABC), this study will provide participants with unique insight into the association between olfaction and balance function, potentially linked through the cerebellum.

Objectives: The objective of this study is to characterize the association between olfactory and balance dysfunctions and how this relates to prospective incidence of falls in a cohort of aging adults. Study Design: Cohort study. Methods: The Health ABC study was queried to identify 296 participants with data on both olfactory function (measured using the 12 item Brief Smell Identification Test) and balance related function (measured using the Romberg test). The relationship between olfactory dysfunction and balance dysfunction was investigated using multivariable logistic regression. Demographic characteristics and comorbidities were analyzed alongside olfactory/balance dysfunction status to find predictors of performance on a standing balance assessment. The same covariates were studied in a Cox proportional hazards model to find predictors of incidental falls. Results: Of 296 participants, 52.7% had just olfactory dysfunction, 7.4% had just balance dysfunction, and 5.7% had both. Severe olfactory dysfunction was associated with increased odds of balance dysfunction when compared to those

without olfactory dysfunction, even when adjusting for age, gender, race, education, BMI, smoking, diabetes, depression, and dementia (OR=4.1, 95% CI [1.5,13.7], p=0.011). Having both olfactory and balance dysfunctions was associated with worse performance on a standing balance assessment (β =-22.8, 95% CI [-35.6,-10.1], p=0.0005) as well as increased incidental falls (β =1.5, 95% CI [1.0,2.3], p=0.037). Conclusions: This study highlights a unique relationship between olfaction and balance, and how impairments in these are associated with a prospective risk of falls. Further study is warranted to identify the mechanistic link between olfaction and balance and understand how to leverage this relationship to mitigate risk in older adults.

4:25 - 4:30

Q&A

4:30 - 5:25

PANEL

Updates and Inspirations: Management of Obstructive and Central Sleep Apnea

Moderator:

Jolie L. Chang, MD FACS, San Francisco, CA

Panelists:

Central Sleep Apnea and Novel Therapy

Qanta Ahmed, MD FACP FCCP FAASM, New York, NY

What To Do When Nerve Stimulation is not an Option

M. Boyd Gillespie, MD MSc FACS, Memphis, TN

Pediatric OSA - Beyond T&A

Eileen M. Raynor, MD FACS, Durham, NC

5:25 - 5:30

Q&A

5:30

ADJOURN

5:45 - 7:00

VICE PRESIDENTS WELCOME RECEPTION (open to all attendees) - Windsor Lawn

THURSDAY CONCURRENT SESSIONS 3:30 - 5:30

LARYNGOLOGY/BRONCHESOPHAGOLOGY SESSION D - CORONET ROOM

3:30 - 4:25

PANEL

Dysphagia in 2023

Moderator:

Phillip C. Song, MD, Boston, MA

Panelists:

Jonathan M. Bock, MD, Milwaukee, WI

Karla D. O'Dell, MD, Los Angeles, CA

Mausumi N. Syamal, MD, Bethlehem, PA

4:25 - 4:30

Q&A

Moderator:

Libby J. Smith, DO, Pittsburgh, PA

4:30

TRIOLOGICAY SOCIETY THESIS HONORABLE MENTION FOR CLINICAL RESEARCH AWARD

Serial In-office Steroid Injections for Airway Stenosis: Long Term Benefit and Cost Analysis

Karla D. O'Dell, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the role of serial steroid injections in the treatment of subglottic and tracheal stenosis.

Objectives: To evaluate the long-term benefit of serial in office steroid injections (SISI) in the treatment of subglottic and proximal tracheal stenosis (SG/PTS). Evaluate cost of SISI compared to endoscopic dilation.

Study Design: Retrospective study and cost analysis. **Methods:** All patients with SGS/PTS with at least 2 consecutive in-office steroid injection between 2013 and 2021 were evaluated. Patients with less than 2 years of follow up data after the initial SISI series were excluded. Demographics, etiology of stenosis, total injections performed, time between steroid series, surgery free interval and adverse events were collected. For patients with known surgical history before SISI, pre-SISI surgery free interval (SFI) was compared. Institutional billing records and the national CMS average reimbursement were evaluated. Total charges for 3 treatment strategies (endoscopic dilation alone, endoscopic dilation with post-operative SISI and primary intervention with SISI) were also compared. **Results:** 49 patients were included; 29 (59%) idiopathic, 11 (22%) traumatic and 9 (18%) rheumatologic. Mean (SD) follow up time after the first SISI was 3.41 years (1.5), range (2.08-7.25 years). 79% (39/49) did not require additional surgery during the entire follow-up period. The surgery free interval (SFI) improved from a mean 13.5 months (SD 12.6; range 2-42 months) pre- SISI to a mean (SD) of 42 months (SD 20.2; range (10-87 months) ($p < 0.0001$) after SISI. Annual average charges for endoscopic dilation alone in our cohort was \$15,383.28, compared to \$7,070.04 for SISI. **Conclusions:** Serial in office steroid injections are an effective treatment for patients with SG/PTS. In office steroid injections could offer cost savings for the patient.

4:35

Amprenavir Protects against Pepsin Mediated Laryngeal E-cadherin Cleavage and Matrix Metalloprotease Induction in vitro

Tina L. Samuels, MS, Milwaukee, WI; Simon Blaine-Sauer, BS, Milwaukee, WI; Alexandra M. Lesnick, BS, Milwaukee, WI; Ke Yan, PhD, Milwaukee, WI; Amit Joshi, PhD, Milwaukee, WI; Nikki Johnston, PhD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should have better understanding of the molecular mechanisms by which pepsin targeting compounds such as fosamprenavir/amprenavir may protect against laryngeal damage caused by laryngopharyngeal reflux.

Objectives: Laryngopharyngeal reflux (LPR) causes chronic cough, throat clearing, hoarseness and dysphagia and can promote laryngeal carcinogenesis. More than 20% of the US population suffers from LPR and there is no effective medical therapy. Pepsin is a predominant source of damage during LPR which disrupts epithelial barrier function potentially via E-cadherin cleavage and ma-

trix metalloprotease (MMP) dysregulation. Fosamprenavir (FDA approved HIV therapeutic and prodrug of amprenavir) is a pepsin inhibiting LPR therapeutic candidate shown to rescue damage in an LPR mouse model. This study aimed to examine amprenavir protection against pepsin-mediated laryngeal epithelial damage in vitro. Study Design: Basic translational. Methods: Laryngeal (TVC HPV) cells were pretreated with Hank's buffered saline (HBSS) before exposure to HBSS or HBSS pH4 +/- 1mg/ml pepsin +/- amprenavir (10-60minutes). Analysis was performed by microscopy, Western blot, and qPCR. Results: Amprenavir (1uM) rescued pepsin acid mediated cell dissociation ($p<0.05$). Pepsin acid caused E-cadherin cleavage indicative of regulated intramembrane proteolysis (RIP) and increased MMP-1, 7, 9, 14 24 hours post-exposure ($p<0.05$). Acid did not cause cell dissociation or E-cadherin cleavage. Amprenavir (10uM) rescued E-cadherin cleavage and MMP-1, 9, 14 induction ($p<0.05$). Conclusions: Amprenavir, at serum concentrations achievable provided the manufacturer's recommended dose of fosamprenavir for HIV, protects against pepsin mediated cell dissociation, E-cadherin cleavage and MMP dysregulation thought to contribute to barrier dysfunction and related symptoms during LPR. Fosamprenavir to amprenavir conversion by laryngeal epithelia, serum and saliva, and relative drug efficacies in an LPR mouse model are under investigation to inform development of inhaled formulations for LPR.

4:40 **Reassessing the Role of Phonomicrosurgery in Management of Reinke's Edema**

Brooke A. Quinton, BS, Cleveland, OH; Khashayar Arianpour, MD, Cleveland, OH; Noah M. Yaffe, BS, Cleveland, OH; Michael S. Benninger, MD, Cleveland, OH; Paul B. Bryson, MD MBA, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to elucidate recurrence rates of Reinke's edema (polypoid corditis) in phonomicrosurgery and compare outcomes in current smokers and former smokers.

Objectives: Reinke's edema (RE) is a benign polypoid degeneration of the true vocal folds that is primarily associated with smoking. Traditionally there has been a hesitation to surgically treat RE -- especially in the setting of continued smoking -- due to previously reported high recurrence rates. With advancement in phonomicrosurgical techniques, this study aims to investigate more recent recurrence rates and further elucidate whether outcomes differ significantly between current smokers and former smokers. Study Design: Retrospective chart review. Methods: Institutional review board approval was obtained. Data was collected from patients who underwent surgical treatment by our laryngologists for Reinke's edema at our institution from 2006 to 2021. Patient variables including demographics, smoking history, operative outcomes and voice outcomes were collected. A random subset of patients was selected for analysis with equal number of smokers versus former smokers. Descriptive statistics were used for analysis. Results: Our analysis included 35 patients treated surgically for RE with microflap excision. 17 patients (49%) were current smokers at the time of operation, while the remainder were former smokers. The mean change in VHI after surgery was -36 points. The overall recurrence rate was 23%. A total 13% of all patients required a repeat operation. Average time until recurrence requiring reoperation was 65 months. Two-tailed Fisher's exact test demonstrated no statistically significant associations between smoking status and change in

VHI ($p=0.606$), recurrence rate ($p=0.394$), and repeat operation rate ($p=0.600$). There was also no significant difference in time to recurrence between smokers ($M=69$, $SD=35$) compared to former smokers ($M=54$, $SD=8.5$), $t(5)=0.9$, $p=0.409$. Conclusions: We report low overall recurrence rates after microflap excision of RE lesions. There was no significant difference in disease recurrence or voice outcomes between smokers and former smokers in our patient group. We recommend joint decision making with patients and counseling on realistic expectations of outcomes especially with respect to smoking status. Further prospective trials are warranted to definitively guide surgical management of RE patients and decision making based on one's smoking status.

4:45 **Characterization of the Local T Cell Receptor Repertoires in Idiopathic Subglottic Stenosis**

Evan Anderson Clark, BS, Nashville, TN; Edward Talatala, BA, Nashville, TN; Wenda Ye, MD, Nashville, TN; Marisol Ramirez, MS, Nashville, TN; Quanhu Sheng, PhD, Nashville, TN; Alexander Gelbard, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants will understand the rationale for exploring T cell receptor repertoires in human tissue. Participants will also be able to explain how the presence of highly clonal memory CD8+ T cell populations in the airway scar of idiopathic subglottic stenosis patients may provide new insights into disease biology.

Objectives: Characterize the local adaptive immune response in the airway scar of idiopathic subglottic stenosis (iSGS) patients. Study Design: Biopsies of airway scar from patients with idiopathic subglottic stenosis (iSGS) were processed and analyzed via single cell RNA sequencing (scRNAseq). The unique T cell receptor (TCR) from each cell was used to interrogate the native T cell repertoire. Methods: Scar biopsies were obtained from 5 iSGS patients. TCR clonotypes were characterized using single cell RNA sequencing (scRNAseq). Established bioinformatic pipelines in Seurat and Immunarch were employed to explore TCR diversity and quantify TCR repertoire clonality. Results: Single cell RNA sequencing provided unique TCR sequences for individual T cells. In all samples, the presence of distinct dominant CD8+ T cell clones could be detected. Longitudinal analysis in one patient suggests stable persistence of the dominant clone over time. Interrogation of the TCR repertoires in various T cell subsets showed the resident memory CD8+ T cell subset (TRM) was significantly more clonal when compared to non-memory CD8+ T-cells (clonality score: CD8+ TRM vs. CD8+ TnonRM; 0.577 vs. 0.123, $P = 0.0007$). Conclusions: In iSGS airway scars, CD8+ TRM harbor dominant clones that appear stable over time. The target of these T cell populations is unknown and exploration of the antigenic target represents a novel strategy to unravel iSGS disease biology.

4:50 **WITHDRAWN - Impact of for Profit Hospital Ownership Status on Total Laryngectomy Outcomes and Cost of Care: A Propensity Match Scored Analysis**

Mehdi Skender Lemdani, BA, Newark, NJ; Hannaan S. Choudhry, BA, Newark, NJ; Rushi Patel, BA, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

4:55 - 5:00

Q&A

Moderator:**Douglas J. Van Daele, MD FACS, Iowa City, IA****5:00 Surgical Outcomes in Zenker Diverticula: A Multicenter, Prospective, Longitudinal Study**

Rebecca J. Howell, MD, Cincinnati, OH; Brittany N. Krekeler, CCC-SLP PhD, Cincinnati, OH; Meredith Tabangin, MPH, Cincinnati, OH; Mekibib Altaye, PhD, Cincinnati, OH; Shaun A. Wahab, MD, Cincinnati, OH; Gregory N. Postma, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the demographic population of patients with Zenker diverticula, describe surgical outcomes using validated patient outcome scores as both raw data and percent change, and to compare surgical outcomes in endoscopic vs open surgical treatment.

Objectives: To determine percent change in patient reported outcome measures (PROM, e.g., Eating Assessment Tool, EAT-10) after surgical intervention to treat Zenker diverticula (ZD). To compare outcomes between endoscopic vs open surgery approach for patients with ZD. **Study Design:** Prospective, multicenter cohort study of all individuals enrolled in the prospective outcomes of cricopharyngeal hypertonicity (POUCH) collaborative with a known ZD. **Methods:** Patient survey, radiography reports, and PROM data were abstracted from a REDCap database which summarized means, medians, percentages, and frequencies of EAT-10 scores per procedure. Outcome based on operative intervention (endoscopic vs open) was compared using a t test and Wilcoxon Rank Sum test, as appropriate. **Results:** A total of 151 persons were included. The mean age (SD) of the cohort was 68.7 (11.0). Data showed a 49% of patients reported a 100% improvement in EAT-10; 75.5% of patients had greater than 75% improvement; 84% will have greater than 50% improvement. Endoscopic approach was used for 112 patients, and 39 open surgical intervention. Mean (SD) difference in raw EAT-10 scores for endoscopic treatment was -13.4 (10.2) compared to -17.9 (10.3) for open, $p=0.02$. The median [interquartile range, IQR] EAT-10 percent difference for endoscopic treatment was 94.2% [71.7, 100] and open was 100% [80, 100], $P=0.16$. **Conclusions:** 75.5% of patients undergoing ZD surgery will improve EAT-10 scores by 75% or more. Open transcervical surgery improves raw EAT-10 scores greater than endoscopic treatment, however, when looking at percent change from baseline, both interventions are effective.

5:05 Spasmodic Dysphonia Patients' Perception of Pain with Botulinum Toxin Injections

Austin Heffernan, BMSc, Vancouver, BC Canada; Amanda Hu, MD FRCSC, Vancouver, BC Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the pain associated with botulinum toxin injections and list the factors that impact this pain experience in patients diagnosed with spasmodic dysphonia.

Objectives: To evaluate pain associated with laryngeal botulinum toxin injections and to determine factors predictive of pain scores. **Study Design:** Pro-

spective cohort study. Methods: Adult patients with spasmodic dysphonia that presented to a tertiary laryngology practice for botulinum toxin injections were recruited from March to July 2022. Patients completed the visual analog scale (VAS) before the procedure. Ten minutes post-procedure they completed VAS and the short form McGill Pain Questionnaire (SF-MPQ). Factors that may affect pain were extracted from patient charts. Descriptive statistics, univariate, bivariate, and multivariate analyses were conducted ($\alpha=0.05$). Results: One hundred and twenty-three patients were included (63 +/- 14yo, 26% male). SF-MPQ reported mild pain (4.14 +/- 3.99 out of 45) with a pain intensity of none to mild (0.71 +/- 0.84 out of 5). Bilateral injections yielded significantly higher SF-MPQ scores (5.19 +/- 4.66) than unilateral injections (3.38 +/- 3.31) ($p=0.014$). There was a significant VAS reduction from pre 2.91 +/- 2.48 (out of 10) to post 2.48 +/- 2.24 (p less than 0.001). Bilateral injections ($p=0.006$), psychiatric diagnosis ($p=0.035$), taking neurological, pain or psychiatric medications (NPPM) ($p=0.013$), or higher vocal handicap index (VHI) ($p=0.013$) were associated with increased preprocedural pain. Patients who are not professional voice users (PVU) ($p=0.013$) and those taking NPPM ($p=0.018$) experienced greater post-procedural pain. Multivariate analysis yielded no significant results for the primary outcome measure, SF-MPQ. Conclusions: Botulinum toxin injections were well tolerated with low pain scores. Patients predicted a higher level of pain than they experienced. Factors associated with pain included bilateral vs unilateral injection, psychiatric diagnosis, NPPM, VHI, and PVUs.

5:10

Assessing the Biocompatibility and Regeneration of Electrospun Nanofiber Composite Tracheal Grafts

Lily Kreber, BS, Columbus, OH; Lumei Liu, PhD, Columbus, OH; Sayali Dharmadhikari, MS, Columbus, OH; Zheng Hong Tan, MS, Columbus, OH; Jed Johnson, PhD, Columbus, OH; Tedy Chiang, MD, Columbus, OH

Educational Objective: After this poster/presentation, the audience will understand the need for a solution to long segment tracheal defects and the potential of an electrospun composite tracheal graft as a novel solution.

Objectives: Composite tracheal grafts (CTG) combining decellularized scaffolds with external biomaterial support have been shown to support host derived neo-tissue formation. In this study, we examine the biocompatibility, graft epithelialization, vascularization, and patency of 3 prototype CTG using a mouse microsurgical model. Study Design: Tracheal replacement, regenerative medicine, biocompatible splint, animal model. Methods: CTG electrospun splints made by combining partially decellularized tracheal grafts (PDTG) with PGA, PLCL, or PLCL/PGA were orthotopically implanted in mice ($N=10$ /group). Hosts underwent microCT in vivo and tracheas were explanted two weeks post-implantation. Gross images were taken at implantation and explantation. Histological analysis was used to assess for epithelialization and neovascularization. Results: Most animals survived until planned endpoint and did not exhibit respiratory symptoms (greater than 80%). MicroCT revealed the preservation of graft patency. Grossly, the PDTG portion of CTG remained intact. Examining the electrospun component of CTG, PGA degraded significantly, while PLCL+PDTG and PLCL/PGA+PDTG maintained their structure. Microvasculature was observed across the surface of CTG and infiltrating the pores. There were no signs of excessive cellular infiltration or encapsulation. Graft microvasculature and epithelium appear similar in all groups, suggesting that CTG did not hinder endothelializa-

tion and epithelialization. Conclusions: We found that all electrospun, nanofiber CTGs are biocompatible and did not affect graft patency, endothelialization and epithelialization. Future directions will explore methods to accelerate graft regeneration of CTG.

5:15 **Vocal Care and Rates of Treatment Followup for Transgender Voice Patients**

Raymond J. So, AB, Baltimore, MD; Kevin Biju, MS, Baltimore, MD; Ashley C. Davis, MS, Baltimore, MD; Lee M. Akst, MD, Baltimore, MD; Alexander T. Hillel, MD, Baltimore, MD; Simon R. Best, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to understand factors associated with loss to followup in transgender patients seeking vocal care. We hope to educate attendees on potentially modifiable domains to improve access to and sustainability of vocal care for the transgender patient population.

Objectives: To identify factors associated with loss to followup (LFU) among transgender patients seeking vocal treatment. Study Design: Retrospective cohort study. Methods: Transgender vocal care at our clinic consists of an initial joint evaluation by otolaryngology and speech language pathology (SLP), usually followed by a referral for vocal therapy (VT) and/or vocal surgery (VS). A chronological timeline of care was recorded for transgender patients seen at our vocal clinic from January 2018 to May 2022. A logistic regression was used to identify characteristics associated with patient LFU, defined as not completing the recommended treatment course with no contact with either otolaryngology or SLP for more than three months. Results: Of the resulting 73 patients, 59 (81%) were male at birth, and 72 (99%) were non-Hispanic White. 69 (95%) patients received an initial referral for vocal therapy, all of whom received at least one session. 17 (23%) patients received a referral for and followed through with VS. LFU occurred for 35 (48%) patients. Patients who received VS were significantly less likely to exhibit LFU (OR: -1.84 (-3.46, -0.23); $p=0.03$). In contrast, LFU was more likely to occur in patients without access to telemedicine options (OR: 2.46 (0.82, 4.10); $p=0.003$); and in patients who concurrently received non-voice gender affirming treatments (OR: 1.49 (0.30, 2.68); $p=0.01$). Conclusions: Providing telemedicine options for transgender voice patients increases followup rates. Transgender patients who pursue multiple gender affirming treatments simultaneously are at increased risk for LFU. Clinicians should encourage transgender patients to seek vocal care either before or after other gender affirming procedures.

5:20 **Efficacy of In-Office Balloon Dilation for Patients with Cricopharyngeal Abnormalities**

Adithya Reddy, BSE, Charlottesville, VA; Neil Saez, MD, Charlottesville, VA; Julian De La Chapa, MD, Charlottesville, VA; James Daniero, MD MS, Charlottesville, VA; Patrick McGarey, MD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the comparative efficacy of in-clinic esophageal balloon dilation versus sedated savory esophageal dilation.

Objectives: Upper esophageal sphincter (UES) dilation is a treatment for cricopharyngeal abnormalities that can be done in the clinic or the operating room. Benefits of treatment in-clinic include decreased anesthesia risk, wait times, and healthcare costs. This study compares symptomatic outcomes between unseated, in-clinic balloon dilation to sedated savory dilation over guidewire. Secondary outcomes include comparative duration of benefit and patient tolerance of in-clinic dilation. **Study Design:** Retrospective case control study. **Methods:** Variables indicating pre-procedure symptoms, functional abnormalities of the upper digestive tract, swallow study findings and maximal UES dilation were compared between groups. Change in Eating Assessment Tool (EAT-10) scores and qualitative symptoms were compared. Multivariate analysis and one way analysis of variance were conducted to assess for predictors of procedural success. **Results:** A total of 17 in-clinic dilations (ICD) and 13 guidewire dilations (GD) met inclusion criteria, without significant difference on pre-procedural factors. ICD and GD groups demonstrated no difference in EAT-10 score change at -9 (95% CI, -14, -5) or effect duration at 5.5 months (95% CI, 3.6, 7.4). While the presence of esophageal dysmotility, prior cervical radiation, and anterior cervical discectomy and fusion plate had a significant effect on symptomatic improvement and duration of benefit at the multivariate level, these were not significant at the univariate level. 41% (7 patients) preferred repeating ICD over GD if necessary. **Conclusions:** There is no difference in symptomatic improvement or longevity between ICD and GD in this population. More so than procedure location, esophageal dysmotility and prior radiation portend decreased efficacy. Cost benefit analysis of ICD vs GD deserves investigation.

5:25 - 5:30**Q&A****5:30****ADJOURN****5:45 - 7:00****VICE PRESIDENTS WELCOME RECEPTION (open to all attendees) - Windsor Lawn**

FRIDAY JANUARY 27, 2023

6:45 - 7:30 BUSINESS MEETINGS (Fellows Only)
SOUTHERN SECTION - Garden Room
WESTERN SECTION - Continental Room

7:00 - 7:30 BREAKFAST FOR ATTENDEES - Ocean Ballroom

GENERAL SESSION 7:30 - 8:30 - CROWN ROOM

7:30 - 8:20 TRIOLOGICAL BEST PRACTICES PANEL

Moderator:

Anil K. Lalwani, MD FACS, New York, NY

Panelists:

**Should Oral Antibiotics Be Prescribed Routinely
Postendoscopic Sinus Surgery?**

Christopher J. Chin, MD, Saint John, NB Canada

Is Percutaneous Tracheostomy Safe?

Karen M. Kost, MD, Westmount, QC Canada

**What is the Best Test for Diagnosis and Monitoring
Treatment Response in Malignant Otitis Externa?**

Anil K. Lalwani, MD FACS, New York, NY

What is the Role of Transoral Thyroidectomy?

Cherie-Ann Nathan, MD FACS, Shreveport, LA

**What Is the Optimal Timing for Dividing a Forehead
Flap?**

Travis T. Tollefson, MD MPH FACS, Sacramento, CA

8:20 - 8:30 Q&A

FRIDAY CONCURRENT SESSIONS 8:30 - 10:30

FACIAL PLASTIC & RECONSTRUCTIVE SESSION E - CORONET ROOM

Moderators:

Lamont R. Jones, MD MBA, Detroit, MI

Urjeet A. Patel, MD FACS, Chicago, IL

8:30 **Age Related Histologic and Biochemical Changes in Auricular and Nasal Cartilages**

Sulgi Kim, Chapel Hill, NC; Deanna Menapace, MD, Omaha, NE; Mark Mims, MD, Oklahoma City, OK; William Shockley, MD, Chapel Hill, NC; Madison Clark, MD FACS, Chapel Hill, NC (Presenter)

Educational Objective: At the conclusion of this presentation, the participants should be able to gain knowledge that first there are age related histological changes in the nasal and auricular cartilage, and secondly, despite histological changes, septal and auricular cartilage do not lose their utility for grafting in nasal surgery in the elderly population.

Objectives: Analyze age related changes in histologic appearance and biochemical properties of human auricular cartilage and two subsites of nasal cartilages (quadrangular cartilage and dorsal septal articulation with upper lateral cartilages). **Study Design:** Prospective cross-sectional study of nasal and auricular cartilages from seventy-three (73) live donors. **Methods:** Auricular cartilage, quadrangular cartilage, and dorsal septal cartilage articulation were collected intraoperatively. Histochemical staining was used: safranin O for glycosaminoglycans, Verhoeff's for elastin, and Masson's trichrome for collagen. ImageJ2 software, version 2.3.0, National Institute of Health, Bethesda, MD, was used to calculate cell count and percent stained for each cartilage type. R studio, RStudio, PBC, Boston, MA, ggplot package was used to visualize ages versus cell count or percent stained. **Results:** Participant ages ranged from 20 to 77 years, average 46.5 years. There was a significant decline in glycosaminoglycans with age for dorsal septal articulation subsite, (n = 64, p < 0.001). A significant increase in collagen content with age was observed in dorsal septal articulation subsite (n = 66, p < 0.001) as well as for the quadrangular cartilage subsite (n = 64, p < 0.05). There was a decline in elastin with all ages (n = 41, p = 0.309) for auricular cartilage. Cell count declined with age for auricular and dorsal septal articulation but declined most significantly at the quadrangular cartilage subsite (n = 64, p < 0.05). **Conclusions:** Our findings confirm that there are age related decreases in cartilage glycosaminoglycan content and chondrocyte cell count in both auricular and nasal cartilages. Specifically for auricular cartilage, there is also an age related decline in elastin content. We have also confirmed that collagen content increases with age for both auricular and nasal cartilage. These histologic findings provide further evidence that although there are some losses of structural integrity and flexibility in septal and auricular cartilage, they do not lose their utility for grafting in nasal surgery in the elderly population.

8:35 Utilizing Iliac Crest Bone Graft with Anterolateral Thigh Fascia Lata Free Flap for Rescue of Mandibular Osteoradionecrosis

Sara Liu, MD, Minneapolis, MI; Khashayar Arianpour, MD, Cleveland, OH; Brandon Prendes, MD, Cleveland, OH; Michael Fritz, MD, Cleveland, OH

Educational Objective: Vascularized anterolateral thigh fascia lata (ALTFL) has been described by our institution as a reliable, low morbidity, and effective method to arrest mandibular osteoradionecrosis. In this series of patients, we report the success of ALTFL free flap in conjunction with iliac crest bone grafting to augment the native mandible following debridement of bone affected by osteoradionecrosis.

Objectives: Describe use, indications, and outcomes of iliac crest bone graft (ICBG) in combination with anterolateral thigh fascia lata (ALTFL) rescue flap for management of mandibular osteoradionecrosis (ORN). **Study Design:** Case series. **Methods:** Retrospective chart review of patients who underwent ICBG with ALTFL rescue flap for mandibular ORN between 2011-2022. **Results:** Six patients (mean age 64.2 years, 83.3% male) with mandibular ORN who underwent ICBG at time of ALTFL. Patients failed antibiotic therapy (100%) and/or hyperbaric oxygen therapy (66.6%). Preoperative radiographic imaging estimated extent of ORN involvement to be adequate to maintain mandibular stability after debridement. 4 of 6 candidates were felt to be borderline. Subsites involved were body (100%), angle (100%), ramus (33.3%) and parasymphysis (16.7%). Decision to proceed with ICBG was made intraoperatively if cortical height of

retained mandible was 1 cm or less following debridement of ORN to healthy, bleeding bone. Successful clinical and radiographic ORN arrest was achieved in 100% of cases, at mean followup of 26.6 months (6-38). Mean mandible height of ORN defect was 1.8 cm (1.3-2.1) at 19.6 months, indicating ICBG take and viability. There were no major complications related to graft harvest or use. Conclusions: In a subset of patients undergoing ALTFL rescue flaps to arrest mandibular ORN, ICBG is a viable option to supplement bone height with the intent of increasing long term stability. This has been successful in 6 patients with a mean followup of over 2 years, with no observed complications. Long term control of symptoms and radiographic evidence of successful grafting suggest that this method may extend the success of rescue flaps to borderline candidates.

8:40 Ringing the Wrong Bell: The Rate of Potential Tumor Misdiagnosis as Bell's Palsy in a Large Bell's Palsy Cohort

Sandhya Kalavacherla, BS, La Jolla, CA; Eric Du, BS, St. Louis, MO; Benjamin Ostrander, MD, La Jolla, CA; Victor de Cos, BS, La Jolla, CA; Jacqueline Greene, MD, La Jolla, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the rate of Bell's palsy misdiagnosis when an underlying tumor is present.

Objectives: To characterize potential misdiagnoses of tumors as Bell's palsy (BP) and initial treatments received among potentially misdiagnosed patients (PM). Study Design: Retrospective cohort. Methods: A de-identified database of all facial palsy patients who presented to an extensive healthcare system was created using electronic health records. We extracted demographics, medications, and tumor diagnoses potentially affecting facial nerve function post-BP diagnosis. Results: 2,240 patients had BP diagnoses, with a median age of 58, 53% female, and 50% white. Within 3, 6, and 12 months post-BP diagnosis, 43 (1.8%), 66 (2.7%), and 106 (4.4%) individuals received a facial nerve impacting tumor diagnosis with medians of 1.2, 2.1, and 3.8 months between BP and tumor diagnosis, respectively. Cranial nerve tumors were the most commonly diagnosed (66.3%), followed by parotid gland tumors (26%). Among PM, 23.3%, 24.2%, and 23.6% received BP medication pre-tumor diagnosis at each timepoint, while 32% of BP patients with no tumor diagnoses (NT) received BP medication. BP treatment receipt was not significantly different between PM and NT ($p=0.069$). More PM than NT were white (70.9% vs. 53.2%, $p=0.013$) and followed up with ENT (33.7% vs. 5.9%, $p=0.0008$); fewer PM were seen only by the emergency department (2.9% vs. 22.2%, $p=0.0003$). Conclusions: In one of the largest cohorts of patients diagnosed with BP to date, we report the incidence of facial nerve impacting tumor diagnoses in close temporal proximity with preceding BP diagnoses, indicating significant potential misdiagnoses among white patients. Further, those seen by ENT were most likely to receive a correct tumor diagnosis.

8:45 The Effect of Head and Neck Derived Keloid Fibroblast Exosomes on Normal Fibroblasts in Vitro

Oghenefejiro Okifo, MD, Detroit, MI; Albert Levin, PhD, Detroit, MI; Lamont Jones, MD MBA, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the impact of keloid fibroblast exosomes on normal

fibroblasts in vitro.

Objectives: Keloid fibroblasts (KFs) are responsible for the production of excessive extracellular matrix, which is characteristic of keloid disease. It is known that KFs influence the behavior of other cells in the keloid tissue microenvironment (TME); however, the drivers are unknown. Exosomes are extracellular vesicles that promote cell to cell signaling in normal and disease states. The objective of this study is to investigate the impact of KF derived exosomes on normal fibroblasts in vitro. **Study Design:** Prospective controlled tissue culture study. **Methods:** Exosomes from primary head and neck (H&N) KF cell lines were extracted using a previously published protocol. Exosomes from 14 keloid cell lines were combined to create a final KF exosome pool used for administration. A normal human dermal fibroblast cell line (ATCC PSCS-201-012) was treated with the pooled exosomes at 10 μ g/ml and 20 μ g/ml concentrations and allowed to incubate for 24, 48, and 72 hours. Normal fibroblast in exosome free was used as the control. Each experimental condition was performed in triplicate. Seahorse metabolic analysis was used to assess effects on cellular respiration. The Qiagen RT² Profiler PCR human fibrosis array (n=27 genes) was used to assess changes in fibrosis related gene expression, and qPCR assessed HIF1a expression was used as a marker of an inflammatory response. Two sample t tests were used to test for differences in respiration and mean delta quantification cycle (mean Cq) expression between exosome treated and control groups. **Results:** At 24 hours, normal fibroblasts treated with 10 μ g/ml of exosomes had an increase in both mitochondrial respiration and HIF1a expression compared to control (both p<0.05). Further, there was an overall increase in fibrotic gene expression after keloid exosome treatment, with 19 of the 27 fibrosis genes showing differential expression at the 20 μ g/ml exosome treatment dose. Specifically, CCL2 was the gene with the most significant change in expression in both treatment groups (10 μ g/ml p=0.025 and 20 μ g/ml p=0.01), and TFRC, MMP1, IPO8, and VEGFA were the four fibrosis genes demonstrating an exosome dose dependent effect, with increases in expression when comparing the 20 μ g/ml to the 10 μ g/ml treatment groups (p<0.05). **Conclusions:** H&N derived KF exosomes increase mitochondrial respiration and promote profibrotic and proinflammatory gene expression in normal fibroblasts in vitro, suggesting that KF exosomes are mediators of keloid disease processes.

8:50 **Emergent Open Orbital Floor Blowout Fracture Repair: A National Analysis**

Owais M. Aftab, BS, Newark, NJ; Avneet Randhawa, BS, Newark, NJ; Karandeep S. Randhawa, BS, Newark, NJ; Imran M. Khawaja, BA, Newark, NJ; Jean A. Eloy, MD FACS, Newark, NJ; Christina H. Fang, MD, Bronx, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of emergent surgery status and its association with complications following open orbital floor blowout fracture repair.

Objectives: To analyze the association between emergent surgery status and adverse outcomes in patients undergoing open orbital floor blowout fracture repair. **Study Design:** Retrospective database review. **Methods:** This retrospective cohort analysis utilized the 2005-2018 National Surgery Quality Improvement Program (NSQIP) database. Current procedural terminology (CPT) codes were used to identify cases with open treatment of orbital floor blowout fractures

(21385, 21386, 21387, 21390, 21395). Demographics, comorbidities, and complication incidences were compared between patients undergoing emergent surgery and those undergoing nonemergent orbital fracture repair using chi square analyses. The independent effect of preoperative emergent status on adverse outcomes was analyzed using binary logistic regression. Results: 1,146 (96.0%) nonemergent and 48 (4.0%) emergent orbital fracture repairs were identified from 2005 to 2018. Chi square analysis indicated patients undergoing emergent repairs had higher incidences of preoperative wound infection (8.3% vs. 2.3%; $p=0.029$) and systemic sepsis (8.3% vs. 0.6%; $p=0.001$). The emergent cohort had a higher proportion of patients with Hispanic ethnicity ($p=0.011$). Unadjusted chi-square analysis indicated the emergent cohort had a higher incidence of prolonged length of stay (50.1% vs. 10.1%; $p<0.001$). After adjusting for confounders, logistic regression analysis indicated emergent status was an independent risk factor for prolonged length of stay (OR 13.05; 95% CI 5.26 - 32.37; $p<0.001$). Conclusions: Emergent surgery status is an important factor associated with increased odds of prolonged length of stay in patients undergoing open orbital fracture repair.

8:55 - 9:00

Q&A

Moderator:**Uttam K. Sinha, MD, Los Angeles, CA**

9:00

Intraoperative Real Time Fluorescence Labeling of Degenerated Nerves with Novel Nerve Targeting Agent ALM-488 for Reconstructive Surgery

Kayva L. Crawford, MD, La Jolla, CA; Emma Berman, La Jolla, CA; Michael A. Whitney, PhD, La Jolla, CA; Stephen Adams, PhD, La Jolla, CA; Ryan K. Orosco, MD, La Jolla, CA; Quyen T. Nguyen, MD PhD, La Jolla, CA

Educational Objective: At the conclusion of this presentation, the participants should understand the different mechanisms of nerve targeting probes for fluorescence guided surgery and the advantage extracellular matrix binding probes offer in highlighting degenerated nerves compared to myelin binding probes.

Objectives: ALM-488, a nerve targeted peptide dye conjugate, enables intraoperative fluorescence of degenerated peripheral nerves up to nine months post-injury due to its extracellular matrix binding mechanism. In contrast, myelin based agents would not be expected to label degenerated nerves due to myelin degradation during Wallerian degeneration, which occurs within days of injury. This study compares the intraoperative fluorescence produced by ALM-488 and myelin binding dye oxazine 4 in chronically degenerated murine facial nerves. **Study Design:** Observational. **Methods:** Sixteen wild type mice underwent transection of the lower facial nerve division with subsequent degeneration. After five months, ten mice were co-injected with ALM-488 and oxazine 4 and underwent intraoperative facial nerve exposure with fluorescent imaging. Signal to background ratio (SBR) was calculated by comparing the mean gray value at three sites along each degenerated nerve segment to adjacent non-nerve tissue. **Results:** All degenerated nerve segments were clearly visible with ALM-488 ($n = 20$, 10 mice). In contrast, degenerated segments were not visible with oxazine 4 in six out of ten mice. Of the degenerated segments visible in four

mice, the mean SBR for oxazine 4 was significantly lower than ALM-488 (1.27 vs 3.31, $p < 0.001$). We also noted strong fluorescence labeling of autonomic nerves with ALM-488; these were not visible with oxazine 4. Conclusions: ALM-488 produces strong intraoperative fluorescence labeling of degenerated and autonomic nerves in a rodent nerve transection model, whereas myelin binding oxazine 4 does not meaningfully produce fluorescence labeling. This is relevant when choosing nerve labeling agents for reconstructive surgeries involving degenerated nerves, such as facial reanimation, or involving autonomic nerves in other regions, such as prostatectomy.

9:05 **Minimal Access Approaches for Microvascular Free Tissue Transfer in Head and Neck Reconstruction**

Derek J. Vos, BS, Cleveland, OH; Khashayar Arianpour, MD, Cleveland, OH; Michael A. Fritz, MD, Cleveland, OH; Stephen Hadford, MD, Cleveland, OH; Brandon L. Prendes, MD, Cleveland, OH; Peter Ciolek, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to describe indication, technique, patient characteristics and outcomes of minimal access approaches for microvascular free tissue transfer in head and neck reconstruction.

Objectives: To describe out technique, review indications, and evaluate the success of minimal access techniques for recipient vessel identification in microvascular free tissue transfer. **Study Design:** Retrospective chart review. **Methods:** Electronic medical records of all patients who underwent microvascular free flap reconstruction with minimal access techniques between 2011 and 2022 were reviewed. **Results:** We report 235 cases, comprising 213 patients with mean age 60.3 years (3 - 88). The most common primary defect sites were mandible (22.7%), oral cavity (19.2%), cranium (13.7%), maxilla (13.3%), skull base (12.8%), nose/nasal cavity (10.7%) and orbit (3.0%). The most common indications for free flap reconstruction were head and neck cancer extirpation (32.3%), osteoradionecrosis (29.8%), acquired deformity (14.0%), chronic wound (11.9%) and oral motor dysfunction (7.2%). The most common free flap donor sites were anterolateral thigh (84.3%), fibula (7.2%) and radial forearm (6.4%). Artery and accompanying veins utilized include superficial temporal (49.8%), facial (38.3%) and angular (11.1%). A single venous anastomosis was performed in 80.0% of cases, while two were performed in the remainder. 86.7% of veins were hand-sewn while 12.8% were coupled. When specified ($n=197$), anastomotic vein orientation was end to end (88.9%) and end to side (9.0%) or both (0.4%). A majority 61.7% of cases included patients who underwent previous head and neck surgery, while 34.0% had underwent previous free flap reconstruction. The most frequent major surgical complications (overall 10.6%) included flap failure (3.8%), flap/neck hematoma (1.2%) and flap congestion that was salvaged (2.5%). About 45.1% of patients were discharged within 3 hospital days postoperatively (mean 5.2 days). **Conclusions:** Minimal access techniques allow for rapid and consistent recipient site vessel identification for microvascular free tissue transfer. These approaches may be utilized in reconstruction of a broad range of defects of the head and neck, are low morbidity, and contribute to overall shorter length of stay.

9:10 **Supraorbital Rim and Roof Reconstruction with Vascularized Fascia Lata Autogenous Osseous Rib Graft**

Sara Liu, MD, Minneapolis, MN; Ariel Frost, MD, Cleveland, OH;
Michael Fritz, MD, Cleveland, OH

Educational Objective: Reconstruction of complex defects involving the supraorbital rim and orbital roof and adjacent skull base defects using a novel technique of vascularized fascia lata free flap with osseous rib grafting.

Objectives: Describe novel technique for reconstruction of complex defects involving supraorbital rim and orbital roof. **Study Design:** Case series. **Methods:** Retrospective chart review; description of surgical technique. **Results:** Four patients underwent tumor resection with neurosurgery (2 intraosseous hemangioma, 1 meningioma, 1 ossifying fibroma), with mean tumor size of 42.6 cubic centimeters on preoperative imaging. All defects involved supraorbital rim and orbital roof. Patients were reconstructed with autogenous osseous rib graft for structure and contour, and anterolateral thigh fascia lata (ALTFL) free flap to provide robust vascularity to rib bone and as a barrier between skull base dura and the orbit and/or sinonasal cavities. Two patients underwent resection and reconstruction using minimal access (brow/preauricular) incisions, two underwent major cranial and skull base resections. All flaps were vascularized via superficial temporal vessels. On postoperative followup (mean 33.5 months, range 8-48), all patients report no vision change or diplopia, with excellent contour symmetry to contralateral orbit. Followup imaging (mean 29.5 months, range 3-48) demonstrate maintained orbital volume and retention of rib bone graft compared to immediate postoperative imaging. There were no complications related to graft use. Minor complications include 1 patient with cerebrospinal fluid leak managed with lumbar drain placement and 1 patient with mild enophthalmos at 7 month followup. **Conclusions:** We describe a series of patients who underwent a novel technique for reconstruction of complex defects involving supraorbital rim and orbital roof with autogenous osseous rib and vascularized ALTFL free flap with excellent functional and cosmetic outcomes. This can be accomplished using minimal access techniques to minimize patient morbidity.

9:15 **The Gain in Effective Pedicle Length with Musculocutaneous Perforator Dissection in Anterolateral Thigh Free Tissue Reconstruction**

Karolina A. Plonowska-Hirschfeld, MD, San Francisco, CA; Adrian House, MD, Menlo Park, CA; Andrea M. Park, MD, San Francisco, CA; Rahul Seth, MD, San Francisco, CA; Philip Daniel Knott, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the importance of pedicle lengthening through microdissection of musculocutaneous perforator systems during anterolateral thigh free tissue transfer.

Objectives: To measure the gain in effective pedicle length with microdissection of musculocutaneous perforator vessels in anterolateral thigh (ALT) free tissue harvest. **Study Design:** Single institution retrospective cohort study. **Methods:** A review of our institution's free flap database was performed to identify ALT free tissue transfers. Patients for whom documentation of pedicle length prior to and following microdissection of perforator vessels was available were included in analysis. Pertinent clinicopathologic variables were abstracted. **Results:** A total of 289 ALT free flaps were performed between February 2017 and April 2022.

Of these, 63 had documentation of pedicle length before and after perforator microdissection. In this group, ALT reconstruction was performed for oncologic ablative defects (48, 76%) and repair of wound dehiscence or fistulae (15, 24%). The mean pedicle length prior to perforator microdissection was 8.8 cm (standard deviation, SD 3.0 cm; range 3-15 cm). Following perforator dissection, mean pedicle length measured 15.0 cm (SD 3.4 cm; range 7-23 cm) with a mean net gain of 6.3 cm in length. Seven patients (11%) required operating room take back for anastomosis revision (2, 3.2%), recipient site hematoma evacuation (4, 6.4%), and wound dehiscence (1, 1.6%); no complete flap loss was observed. Conclusions: Microdissection of perforator vessels during ALT free flap harvest can increase pedicle length by nearly 40%. This harvest technique can facilitate the performance of tension free anastomoses when vascular pedicles need to be passed through tissue tunnels or under intact skin bridges.

9:20 **Functional Outcomes in Dorsal Preservation Rhinoplasty: A Meta-Analysis**

Matthew I. Saleem, BS, Hemsstead, NY; Anise M. Diaz, BS, Hempstead, NY; Tristan Tham, MD, Hempstead, NY; Alexandros Georgolios, MD, Poplar Bluff, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the postoperative changes in nasal functional status following dorsal preservation rhinoplasty.

Objectives: To compare preoperative and postoperative nasal functional status in dorsal preservation rhinoplasty (DPR). **Study Design:** Meta-analysis. **Methods:** English full text articles were searched in PubMed, Embase, and Scopus on March 13, 2022. Articles had to utilize DPR; report functional metrics such as NOSE, VAS-F, or ROE; include preoperative and postoperative means and standard deviations; and be from a clinical trial, cohort, or case control study. Two reviewers reviewed articles and a third settled disagreements. Preferred Reporting Items for Systematic Reviews and Meta-Analyses Guidelines and the Risk of Bias in Nonrandomized Studies of Interventions tools were used. The inverse variance method with random effects was used for meta-analysis. **Results:** Eight studies, four retrospective and four prospective, were included with a total number of patients (n) = 566. DPR demonstrated improved nasal function postoperatively compared to preoperatively (SMD = 3.63; 95% CI: 2.12-5.13; P = 0.00001). Subgroup analysis showed both prospective (SMD = 3.90; 95% CI: 1.86-5.93; P = 0.0002) and retrospective (SMD = 3.30; 95% CI: 0.84-5.75; P = 0.00001) studies demonstrated improved functional outcomes after DPR. There was significant heterogeneity found in the overall analysis (P = 0.00001; I² = 99%) and no difference in subgroups (P = 0.71; I² = 0%). **Conclusions:** There is significant nasal functional improvement following DPR. This suggests that preserving native nasal anatomy during rhinoplasty not only has cosmetic, but functional utility.

9:25 - 9:30 **Q&A**

9:30 - 10:25 **PANEL**
Preservation Rhinoplasty - Or, Less Can Be More
Moderator:

Deborah Watson, MD FACS, San Diego, CA

Panelists:

J. Madison Clark II, MD FACS, Chapel Hill, NC
 Jose E. Barrera, MD FACS, San Antonio, TX
 Brian J.F. Wong, MD PhD FACS, Irvine, CA
 Deborah Watson, MD FACS, San Diego, CA

10:25 - 10:30 Q&A

10:30 - 11:00 BREAK WITH EXHIBITORS - Ocean Ballroom

FRIDAY CONCURRENT SESSIONS 8:30 - 10:30
GENERAL & SLEEP MEDICINE SESSION F - CROWN ROOM

8:30 - 9:25 **PANEL**
Artificial Intelligence, Machine Learning and Virtual Reality in Otolaryngology

Moderator:

Romaine F. Johnson, MD MPH, Dallas, TX

Panelists:

Ivan H. El-Sayed, MD FACS, San Francisco, CA
 Eric Gantwerker, MD MMSc FACS, New Hyde Park, NY
 Maya G. Sardesai, MD Med, Seattle, WA

9:25 - 9:30 Q&A

Moderator:

Ashutosh Kacker, MD FACS, New York, NY

9:30 **Should Lateral Wall Collapse be a Contraindication for Hypoglossal Nerve Stimulation?**

Thomas H. Fitzpatrick IV, MD, Richmond, VA; Graham Pingree, BS, Richmond, VA; Andrew Chafin, BS, Richmond, VA; Ryan S. Nord, MD, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to better treat obstructive sleep apnea patients with lateral wall collapse.

Objectives: This study examines the effects of oropharyngeal lateral wall collapse on hypoglossal nerve stimulation (HNS) outcomes. Study Design: The study was conducted via retrospective chart review and is a case control study. Methods: Patients (n=192) queried from a single surgeon's database of HNS cases were divided into groups based on the degree of oropharyngeal lateral wall collapse on drug induced sleep endoscopy (complete; partial/none). In each case, AHI reduction, Epworth Sleepiness Scale (ESS) score, stimulation voltage, average usage, need for alternate device configuration/awake sleep endoscopy, and fulfillment of Sher's criteria were collected (1). Patients with complete collapse were compared to those with partial/none via student's t tests and Pearson's chi square test. Results: Of the 192 patients included, 62 had complete, 53 partial, and 52 with no lateral oropharyngeal wall collapse. 25 pa-

tients were excluded from analysis for various reasons. There were no statistically significant differences found between the complete and partial/none groups in age, BMI, sex, preop AHI, postop AHI, change in AHI, preop ESS, postop ESS, change in ESS, voltage, the number of subjects who required alternate device configuration, or average nightly adherence when examined. Notably, a significantly greater number of the partial/none group met Sher's criteria for surgical success ($p=.018$). Conclusions: Complete oropharyngeal collapse on preoperative drug induced sleep endoscopy is associated with a lower likelihood of surgical success in hypoglossal nerve stimulation.

9:35 **Evaluating Particle Aerosolization during in-Office Otolaryngology Procedures**

Homero Harari, ScD MSc, New York, NY; Rocco M. Ferrandino, MD MSCR, New York, NY (Presenter); Ameya Jategaonkar, MD, Phoenix, AZ; Diana Kirke, MBBS MPhil FRACS, New York, NY; Mark S. Courey, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss aerosolized particle generation during in-office otolaryngology procedures and the utility of surgical masks as a mitigation strategy.

Objectives: The primary objective is to quantify aerosol generation during in-office otolaryngology procedures to better understand the potential for disease transmission. Additionally, we aim to measure the efficacy of widely available surgical masks as a mitigation strategy for reducing aerosolized particle emission. Study Design: Healthy volunteer study. Methods: Healthy volunteers were recruited to evaluate their aerosol generation during breathing, talking, yelling, coughing, sneezing, tongue depressor examination, topical nasal spray, transoral rigid laryngoscopy, flexible nasal endoscopy, and flexible laryngoscopy. An aerodynamic particle sizer (APS) measured aerosolized particles sizes 0.5-20 μm in a laminar flow hood during the aforementioned experimental conditions. To assess the effectiveness of masks as a mitigating intervention, measurements were also conducted while volunteers wore a standard surgical mask. We obtained each measurement in duplicate and results were reported using paired statistical testing. Results: Compared to conversational speaking; yelling, sneezing, and application of topical spray demonstrated significantly more particle aerosolization. Quiet breathing, coughing, tongue depressor examination, and transoral laryngoscopy demonstrated similar particle aerosolization to speaking. Nasal endoscopy and flexible laryngoscopy actually had significantly less particle emission than speaking. Wearing a surgical mask significantly reduced aerosolization for all conditions tested when compared to unmasked conditions. Conclusions: Common otolaryngology procedures are no more aerosolizing than conversational speech. Surgical masks can help to mitigate aerosol generation during typical otolaryngology office encounters.

9:40 **Phenotypic Similarities and Differences Based on Age in Two Large Cohorts of Obstructive Sleep Apnea Patients**

Deeyar Itayem, MD, Memphis, TN; Hunter Skoog, MD, Birmingham, AL; Michael Herr, PhD, Birmingham, AL; Sudhir Manickavel, MD, Birmingham, AL; Kirk Withrow, MD, Birmingham, AL; Marion Boyd Gillespie, MD MSc, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to determine whether there are differences in phenotype based on age for patients diagnosed with obstructive sleep apnea and whether this difference has treatment implications.

Objectives: To determine whether there are differences in phenotype based on age for patients diagnosed with obstructive sleep apnea (OSA) and whether this difference has treatment implications. **Study Design:** Multi-institutional retrospective cohort study. **Methods:** Electronic medical records were reviewed from two academic, tertiary sleep surgery clinics from October 2016 through July 2021. Variables of interest included age; gender; race; body mass index (BMI); tonsil size; modified Mallampati scores; total apnea hypopnea index (AHI); oxygen nadir scores; presence or absence of complete circumferential palatal collapse on drug induced sleep endoscopy (DISE); history of tissue removal surgery; and history of hypoglossal nerve stimulation implantation. Patients were divided into age cohorts (younger versus older than 50 years old), and possible associations between age and the remaining variables were investigated. **Results:** Younger patients had higher BMIs and larger tonsil sizes ($p < 0.0001$ for both). AHI and Mallampati scores were similar between age groups ($p = 0.47$ and $p = 0.56$ respectively). O₂ nadir was worse in the older age groups ($p = 0.018$). Patients older than 50 years old had a lower rate of complete circumferential palatal collapse. More of the younger patients underwent tissue removal surgery ($p < 0.001$) versus the older patients who underwent hypoglossal nerve stimulation ($p < 0.0001$). **Conclusions:** OSA patients are presenting in two distinct age phenotypes. Younger patients were found to have more tissue hypertrophy. The older group had a phenotype consistent with neuromuscular collapse. The former group may require tissue reductive surgery for CPAP salvage, whereas the latter group may be better candidates for hypoglossal nerve stimulation.

9:45 Qualitative Study Assessing Factors Regarding 30 Day Readmissions in an Otolaryngology Cohort: A Patient's Perspective

Simon Beatty, BS, Kansas City, KS; Joseph Penn, BS, Kansas City, KS; Mackenzie O'Donnell, BS, Kansas City, KS; Jennifer Villwock, MD, Kansas City, KS

Educational Objective: At the conclusion of this presentation, the participants will walk away with a greater understanding of the patient's perspective surrounding discharge and unplanned readmission. This presentation will reinforce the need to focus on all aspects surrounding care, including those outside of medical needs. They will leave with actionable steps to implement in their pre-discharge education and learn of potential next steps to aid in decreasing 30 day readmissions.

Objectives: The purpose of this study was to qualitatively assess the factors that impact readmission rates from the patient and caregiver perspective in an otolaryngology cohort. Our secondary objective was to identify specific gaps in care that resulted in readmission that are amenable to intervention. **Study Design:** This was a parallel methods study design involving descriptive data and semi-structured interviews. **Methods:** Through key informant interviews, we assessed factors that impact readmission rates from the patient perspective. Patients were eligible if they were discharged within the last 30 days following an admission for an otolaryngology related issue. Inductive coding was used to analyze in-

terview transcripts and develop themes. Results: Thirteen respondents were interviewed. 46% (n=6) did not feel ready for discharge after the index admission. Out of these six patients, 83% (n=5) felt their readmission could have been avoided. Patients often encountered unexpected events after returning home from the index admission and felt their readmissions were potentially avoidable with more information regarding what to expect at home, prior to discharge. Although medically stable upon discharge, these findings indicate some patients might be discharged sooner than they should be due to factors outside of medical indications. Conclusions: To address the various biopsychosocial components of patient care in addition to medical aspects, an otolaryngology specific, prior to discharge checklist could aid in lowering 30 day readmissions. Since the amount of education each patient requires to feel competent managing their health at home varies, more work is needed to craft post-education assessments of patient/caregiver competencies for home equipment, prior to discharge to reduce avoidable readmissions.

9:50 **A Multi-Institutional Retrospective Analysis of COVID-19 Tracheostomies: Early vs Late Tracheostomy**

Roger Duyhoang Bui, MD, Shreveport, LA; Ahmad Kasabali, BS, Shreveport, LA; Karuna Dewan, MD, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the relative efficacy of early vs late tracheostomy in COVID patients as it relates to several parameters such as complications, liberation from ventilation and eventual decannulation.

Objectives: The purpose of this investigation is to assess the impact of early tracheostomy on mortality and decannulation rates as well as to elucidate changes in degree of acute hypoxemic respiratory failure as it relates to early and late tracheostomy. Study Design: Retrospective cohort study. Methods: A retrospective chart review was performed on tracheostomies performed on COVID-19 patients since the beginning of the pandemic in March 2020 until May 2022. Descriptive statistics were performed on early tracheostomies, defined as tracheostomy placement less than 14 days on ventilator support, compared to late tracheostomy placement. The variables of interest are time to wean off ventilator, time to decannulation, and various complications. Results: The average length of time to liberation from mechanical ventilation for early trach was 13.88 days vs 18.17 days for late trach, however this difference was not statistically significant. Similarly, average length of time for decannulation was 41.17 days for early vs 47.72 for late tracheostomy. There was no statistically significant difference in liberation from mechanical ventilation rates between early and late tracheostomy (62% vs 55%), or in decannulation rates (40% vs 32). Conclusions: Contrary to some previous studies, the results presented here suggest that early tracheostomies were not associated with improved liberation from mechanical ventilation or decannulation rates. However, this is first such study examining timing of tracheostomy placement in a COVID-19 positive population. Further prospective studies may be warranted in assessing efficacy of early vs late tracheostomy in the COVID patient population.

9:55 - 10:00 **Q&A**

Moderator:

Andrew H. Murr, MD FACS, San Francisco, CA

10:00 Effects of Opioid Prescription Duration Limiting State Legislation on Prescribing Habits of Otolaryngologists

Yun Ji Kim, BA, Los Angeles, CA; Ian Kim, PhD, Los Angeles, CA; Ido Badash, MD, Los Angeles, CA; Kevin Hur, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the effect of opioid prescription duration limiting laws on otolaryngologists' prescribing habits.

Objectives: To identify changes in otolaryngologists' opioid prescribing trends for Medicare beneficiaries associated with the enactment of state laws that limit the duration of prescriptions to three to seven days between the years of 2016 and 2018 in the United States. Study Design: Retrospective cross-sectional study. Methods: Through the Centers for Medicare and Medicaid Services (CMS) database, we retrieved data on Medicare enrollment and on the total days prescribed and total number of beneficiaries for the drugs codeine/acetaminophen, hydrocodone/acetaminophen, oxycodone, oxycodone/acetaminophen, and tramadol, by each prescriber from January 2013 to December 2019. We modeled trends using linear spline regression models that controlled for Medicare beneficiaries' state level sociodemographic characteristics' fixed effects. Results: On average, each otolaryngologist prescribed opioids to 23.1 beneficiaries. The overall prescription length of opioids by otolaryngologists significantly declined by 6% in the law exposed states (from 9.55 days per beneficiary in 2016 to 8.95 days per beneficiary in 2019); however, the decline was significantly lower in the states with a greater proportion of Hispanic/Latinx population and an increased poverty rate. While there were significant declines in oxycodone/acetaminophen and oxycodone prescriptions, no significant declines were observed in tramadol, codeine/acetaminophen, and hydrocodone/acetaminophen prescription. No decline was exhibited in the states that did not pass opioid prescription duration limiting policies or that were excluded from this study. Conclusions: This study shows that the opioid prescribing practices of otolaryngologists were influenced by opioid prescription duration limiting laws passed in 23 states in 2016.

10:05 Comprehensive Airway Quality Improvement Program -- Reducing Life Threatening Respiratory Complications

Zachary Helmen, MD, Miami, FL; Riley Larkin, BS, Miami, FL; Sophia Peifer, BA, Miami, FL; David Arnold, MD, Miami, FL; Tanira Ferreira, MD, Miami, FL; Elizabeth Nicolli, MD, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should understand and be able to duplicate the components of a comprehensive airway quality improvement program as well as recognize the positive effects it can have for primary bedside caregivers and the care of patients with artificial airways.

Objectives: There is often unfamiliarity with the care of artificial airways (i.e., endotracheal tubes, tracheostomies, and laryngectomies), resulting in inadequate routine or emergency care. The objective of this study was to design an airway quality improvement program (AQIP) to improve airway care and compare incidence of airway emergencies. Study Design: This was a retrospective chart review of a prospectively initiated AQIP at a single institution from August 2021

- June 2022 (ongoing). Methods: The AQIP has three parts: 1) mandatory “airway signs” for all airway patients; 2) in-service teaching with a corresponding order set; and 3) an overhead “surgical airway emergency” page involving automatic pages to anesthesia, otolaryngology, and respiratory therapy. Pre- and post-intervention survey data was collected. Incidence of airway emergency was the primary patient outcome. Results: 281 nurses and 76 respiratory therapists were educated. Pre-intervention comfortability scores for the routine care of endotracheal tubes, tracheostomies, and laryngectomies were 4.3 +/- 0.9, 4.3 +/- 0.8, and 3.5 +/- 1.2, respectively. Post-intervention scores increased for all airways to 4.7 +/- 0.6, 4.5 +/- 0.7, and 4.4 +/- 0.7, respectively ($p=0.0006$, $p=0.02$, $p=0.0001$). The same improvement was noted for emergency airway care. Recognition of the difference between a tracheostomy vs. laryngectomy increased from 66.5% to 97.0% ($p=0.0001$). Quiz questions regarding emergency airway management for laryngectomies improved from 76.2% to 93.8% ($p=0.0001$). Airway emergency incidence was 0.75% pre-intervention and 0.82% post-intervention. Conclusions: The AQIP grew competency in airway care and was well received by bedside caregivers. The importance of airway education and readily available airway information was underscored as a result.

10:10 **Apnea and Hypopnea Predominance in Upper Airway Stimulation Outcomes and Drug Induced Sleep Endoscopy Anatomy**

Thomas Zhang Gao, BS, Columbus, OH; Jianing Ma, MS, Columbus, OH; Daniel Hall, MD, Columbus, OH; Vijay K. Rings, BS, Dayton, OH; Ali Zia, MS, Toledo, OH; Eugenio G. Chio, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the influence of apnea versus hypopnea predominance on upper airway stimulation outcomes and drug induced sleep endoscopy anatomy.

Objectives: The influence of apnea and hypopnea predominance on upper airway stimulation outcomes is still poorly defined. We assessed the significance of apnea and hypopnea predominance in UAS outcomes and drug induced sleep endoscopy (DISE) anatomy. Study Design: Retrospective cohort study. Methods: A total of 216 subjects were included in this study, all of which had undergone DISE and UAS implantation. Demographic data and polysomnographic data (preoperative, titration, and 1 year postoperative) were collected. Univariate logistic and linear regression were used to study the association between these data and apnea predominance (> 50% apneas) and hypopnea predominance (50% or greater hypopneas). Kruskal-Wallis rank sum test was used to compare medians between groups for DISE collapse patterns. Results: Sixty-three patients were apnea predominant and 153 patients were hypopnea predominant. These two groups had similar demographic characteristics (all $P > 0.20$). There was no significant difference in UAS outcomes between the groups, assessed using Sher criteria, at the 1 year timepoint. Interestingly, apnea index/apnea-hypopnea index (AI/AHI) and reduction in AHI from preop to titration were significantly associated ($p=0.046$). The median preop hypopnea index was significantly lower ($p=0.033$) in subjects with no oropharyngeal collapse than patients with partial or complete oropharyngeal collapse. There were no significant relationships between AI/AHI and the different degrees of collapse at the velopharynx, oropharynx, tongue base, or epiglottis. Conclusions: In line with CPAP, tonsillectomy, and mandibular advancement therapy studies, we found there was largely no significant difference in DISE anatomy or in UAS treatment outcomes

between apnea and hypopnea predominant individuals.

10:15 Hypoglossal Nerve Stimulator Impact and Its impact on the Positional Component of Obstructive Sleep Apnea

Sudhir Manickavel, MD, Birmingham, AL; John W. Hunsicker, MD, Birmingham, AL; Kirk Withrow, MD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of hypoglossal nerve stimulators in patients with obstructive sleep apnea who have a positional component as well as the factors that influence these outcomes.

Objectives: To determine if there is any change in non-supine AHI postoperatively in patients who underwent hypoglossal nerve stimulator implant as well as determine any preoperative factors associated with postoperative non-supine AHI outcomes. Study Design: Retrospective chart review. Methods: Patients who underwent hypoglossal nerve stimulator placement and had postoperative polysomnography were selected sequentially for review. Demographics, pre and postoperative polysomnography and Epworth Sleepiness Scale, the pattern of collapse on drug induced sleep endoscopy, and hypoglossal nerve stimulator usage and voltage settings were collected. The pattern of the collapse was categorized as pure anterior-posterior collapse or mixed palatal collapse (lateral wall and/or partial concentric collapse). Statistical analysis was then performed to determine if there was any improvement in positional AHI as well as discover any preoperative factors that could predict success. Results: Of the 82 hypoglossal nerve stimulator patients included for analysis there was a significant improvement in non-supine AHI postoperatively (22.99 vs. 6.43, $p < .001$). There was also a significant improvement in supine AHI postoperatively (47.66 vs. 22.54, $p < .001$). In addition, there was no correlation between usage (hrs/week) or voltage and postoperative non-supine AHI. There were no preoperative demographic factors that showed a significant difference in non-supine AHI postoperatively between demographic groups. There were no statistically significant postoperative outcome differences between groups with different collapse patterns. Conclusions: Placing hypoglossal nerve stimulators in patients with an elevated positional AHI preoperatively showed a significant improvement in both the supine and non-supine AHI.

10:20 Medical Malpractice in the Management of Angioedema: A Multidisciplinary Westlaw Analysis

Emma De Ravin, BS, Philadelphia, PA; Neel R. Sangal, MD, Philadelphia, PA; Karthik Rajasekaran, MD FACS, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of multidisciplinary care in acute angioedema management, describe the commonly claimed liabilities and legal outcomes in angioedema medical malpractice claims, and identify strategies to minimize future litigation.

Objectives: The management of acute angioedema is challenging and involves providers in primary care, emergency medicine, and otolaryngology. Timing of evaluation and intervention is imperative and requires complex communication between these groups, as improper management and delays in care can lead to airway compromise and death. This study aims to identify factors that contrib-

ute to malpractice litigation in the management of angioedema (MMA). Study Design: Cross-sectional retrospective cohort review. Methods: The Westlaw comprehensive legal database was queried for MMA cases from 1993-2022. Angioedema misdiagnoses were excluded. Root cause analysis (RCA) was conducted, and cases were classified by defendant specialty, claimed liabilities, complication, verdict, and damage amount awarded. Results: Nine cases of MMA were identified and met inclusion criteria. Eight cases (88.8%) resulted in patient death due to cardiorespiratory compromise secondary to loss of the airway, with one case resulting in long term brain damage. RCA revealed 66% of cases involved failure to establish a timely airway, 55% delayed treatment, 33% failure to diagnose, and 33% improper treatment. Sixty-six percent of the involved practitioners were emergency physicians; primary care and anesthesia were each implicated in one case. Four (44%) cases ruled in favor of the prosecution. Average damage amount was \$3,790,000. In each case there was significant delay in the involvement of otolaryngologists for airway evaluation. Conclusions: Angioedema is a challenging disease that requires active monitoring and management and the coordination of multidisciplinary teams. This study identifies late involvement of airway experts in patient management and risk stratification as a risk factor for litigation and poor outcomes.

10:25 - 10:30 Q&A

10:30 - 11:00 BREAK WITH EXHIBITORS - Ocean Ballroom

FRIDAY CONCURRENT SESSIONS 11:00 - 1:00

GENERAL, RHINOLOGY, ALLERGY, SINUS SESSION G - CROWN ROOM

Moderator:

Amy Anne Donatelli Lassig, MD FACS, Minneapolis MN

11:00 Associations between Subjective and Objective Measures of Olfaction and Gustation in COVID-19 Patients

Brandon J. Vilarello, BA, New York, NY; Tiana M. Saak, BA, New York, NY; Patricia T. Jacobson, BSN, New York, NY; Francesco F. Caruana, BS, New York, NY; David A. Gudis, MD, New York, NY; Jonathan B. Overdevest, MD PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the limited role of self-reported olfactory assessment in diagnosing COVID-19 patients, the relationship between perception of smell and taste and true clinically assessed chemosensory function, and the ongoing need for objective clinical assessment of olfaction in cases of suspected olfactory dysfunction.

Objectives: Olfactory dysfunction is a notable symptom of COVID-19 and potentially has a diagnostic role for active illness. Individual perception of olfactory function is multifactorial: though most individuals correctly report degree of smell and taste dysfunction, certain factors, like older age and cold symptoms, make predicting the true degree of dysfunction difficult. This study seeks to clarify the association between subjective and objective measures of smell and taste in COVID-19 patients. Study Design: Cross-sectional analysis of a prospective, longitudinal cohort study at a tertiary care institution was performed. Methods:

Adults with persistent (3+ months) COVID-19-associated chemosensory disturbance were recruited and provided self-reported measures of smell and taste function and semi-objective psychophysical assessment using Sniffin' Sticks olfaction and Monell gustatory tests. Results: Analysis (n=71) demonstrated a significant association between self-reported smell ability and the Sniffin' Sticks identification assessment ($p=0.005$), controlling for age, sex, COVID-19 vaccination status, and time from COVID-19 diagnosis. There was no statistically significant association between self-reported smell ability and threshold ($p=0.972$), discrimination ($p=0.317$), or overall TDI ($p=0.058$). There was no statistically significant association between self-reported parosmia and TDI ($p=0.468$) or between self-reported taste ability and tastant identification ($p=0.218, 0.260, 0.272, 0.115, 0.987$). Conclusions: Despite the presumed utility of subjective olfactory status in evaluating COVID-19-associated chemosensory deficits and resolution, ability to accurately self-evaluate chemosensation is limited in this patient population. Additional research is needed to learn how self-reported olfactory status corresponds with perception and identification of environmental odors.

11:05 **Measurement of Sinonasal Fluticasone Deposition Using Mass Spectrometry**

Saangyoung E. Lee, MD, Chapel Hill, NC; Elizabeth Ritter, MD, Chapel Hill, NC; Tuong T. Nguyen, BS, Chapel Hill, NC; Princess C. Onuorah, BS, Chapel Hill, NC; Brent A. Senior, MD, Chapel Hill, NC; Adam J. Kimple, MD PhD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the difference between computational fluid dynamic models of the sinonasal cavity, and how mucociliary clearance affects the mobilization of intranasal steroids. The participants will be able to describe how utilizing mass spectrometry is a useful tool for quantifying the in vivo sinonasal absorption of topical steroid sprays.

Objectives: Chronic rhinosinusitis and allergic rhinitis cause significant quality of life ramifications. Intranasal corticosteroids (INCS), such as fluticasone, are a mainstay of treatment, however, there are no in vivo studies that demonstrate INCS deposition in the sinonasal cavity. Computational models estimate 95% of drug deposition on the inferior turbinate head and nasal valve, rather than the sinuses. These models do not account for mucociliary clearance which propels mucus posteriorly. The purpose of this study is to evaluate in vivo sinonasal deposition and absorption of fluticasone. Study Design: Patients with chronic rhinosinusitis and/or allergic rhinitis using fluticasone preoperatively undergoing functional endoscopic sinus surgery or inferior turbinate reduction were recruited. Methods: Intraoperative mucosal samples were obtained from various locations within the sinonasal cavity. Mass spectrometry quantified the amount of fluticasone absorption in each specific anatomic location. Results: Eighteen patients were recruited, resulting in 26 grouped mucosal specimens. There were nine men and nine women, sixteen Caucasian and two African American patients, with an average age of 50.7 years. 61.1% had chronic rhinosinusitis, 27.8% had allergic rhinitis, and 16.7% had both. The site with the greatest of fluticasone concentration absorption was the anterior inferior turbinate. Fluticasone absorption in the posterior inferior turbinate, ethmoid bulla, sphenoethmoidal recess, and maxillary sinus were 65.5%, 80.0%, 12.7%, and 22.8% that of the anterior inferior turbinate respectively. Conclusions: In vivo sinonasal fluticasone absorption is significantly higher distal to the internal nasal valve than estimated

by computational fluid dynamic models. Mucociliary clearance likely plays a critical role in mobilizing intranasal steroids beyond the internal nasal valve.

11:10 **Evaluation of Social Determinants of Health Data Collection in CRS Research**

Corinna G. Levine, MD MPH, Miami, FL; Erin Reilly, MD, Boise, ID; Renata Grovosky, PhD, Miami, FL; Roy R. Casiano, MD, Miami, FL; Ana Palacio, MD MPH, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the distribution of primary clinical research chronic rhinosinusitis (CRS) studies that include data on each: sex, race, ethnicity, and socioeconomic status; 2) compare the demographics of the population included in United States (US) primary CRS clinical research to the US Census population; and 3) understand why collecting sociodemographic variables in clinical research is important to understanding the role of social determinants of health in CRS disease.

Objectives: Determine the distribution of primary clinical research chronic rhinosinusitis (CRS) studies that include data on each: sex, race, ethnicity, and socioeconomic status. Compare the demographics of the population included in United States (US) primary CRS clinical research to the US census population. **Study Design:** Scoping literature review. **Methods:** PubMed database search examining primary CRS clinical research comparing outcomes for two groups of patients over two distinct time periods: 03/01/2020-09/30/2020 and 10/01/2021-03/30/2022. **Results:** Most CRS studies collected information on sex (over 95%). However, only 50% of CRS randomized controlled trials (RCTs) and 33% of cohort studies collect race and ethnicity data. Education and income and other measures of socioeconomic status (SES) are rarely collected (5% of studies). Among all studies that collected sex information, less than 20% adjusted for differences between study groups. Three CRS cohort studies adjusted for race, and one CRS study adjusted their outcomes to income/SES and education. Seventy-eight percent of US CRS studies collected race demographics from their patient population. The majority of the population is White (76%) and the African American/Black population ranged from 1 - 38%. In the 9 US studies that included ethnicity, the total population was 3.6% as compared to the 10% of Hispanics in US population according to the 2020 census. **Conclusions:** Primary CRS clinical research routinely collect data on patient sex, but do not routinely include or adjust for other sociodemographic variables. The lack of sociodemographic information makes it challenging to determine the role of social determinants of health in CRS disease.

11:15 **Predictive Value of Intranasal Ipratropium Response in Diagnosing Cerebrospinal Fluid Rhinorrhea**

Phillip A. Nulty, MD, Detroit, MI; Ed Peterson, PhD, Detroit, MI; John Craig, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the newly demonstrated value of patient reported reduction in rhinorrhea in response to intranasal ipratropium in the workup for CSF rhinorrhea.

Objectives: Unilateral, clear, thin rhinorrhea can be concerning for a nasal ce-

reobspinal fluid (CSF) leak. Beta-2 transferrin (B2-Tf) has been the gold standard for noninvasive confirmatory testing for CSF rhinorrhea, but there can be issues with fluid collection and testing errors. Ipratropium bromide nasal spray (IBNS) is highly effective at reducing rhinitis related rhinorrhea and should presumably not resolve CSF rhinorrhea. This study assessed whether rhinorrhea reduction after IBNS facilitated confirming or refuting CSF rhinorrhea. Study Design: Prospective observational study over 4 years. Methods: Whenever possible, patients with unilateral clear thin rhinorrhea had fluid tested for B2-Tf and were prescribed 0.06% IBNS. Other confirmatory imaging and operative explorations were performed when indicated, and patients were diagnosed with CSF rhinorrhea or other rhinologic etiologies. Multiple clinical variables including IBNS response (rhinorrhea reduction), positional rhinorrhea, salty taste, and others were analyzed for their ability to predict CSF rhinorrhea. Sensitivity, specificity, and predictive values were calculated for all clinical variables. Results: Twenty patients had CSF rhinorrhea, and 52 had non-CSF etiologies. Amongst all clinical variables, only IBNS response demonstrated statistical significance for identifying CSF rhinorrhea (OR=828.3, p=0.001). IBNS response resulted in 96% sensitivity for identifying non-CSF etiologies, and 100% specificity for CSF rhinorrhea, as well as 100% positive and 91% negative predictive values. Conclusions: Response to 0.06% IBNS should be considered in the diagnostic workup of unilateral clear thin rhinorrhea. Reduction in unilateral rhinorrhea after IBNS makes CSF leak unlikely, and lack of IBNS response should increase suspicion for CSF rhinorrhea.

11:20 WITHDRAWN - A National Analysis on the Epidemiology of Anaphylaxis and its Management

Mehdi Skender Lemdani, BA, Newark, NJ; Vivienne Qie, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

11:25 - 11:30 Q&A

Moderator:

Urjeet A. Patel, MD FACS, Chicago, IL

11:30 Predicting Practice Ready Performance for Otolaryngology Key Indicator Procedures

Jenny Xiaoyue Chen, MD EdM, Baltimore, MD; Andrew E. Krumm, PhD, Ann Arbor, MI; Brian C. George, MD MAEd, Ann Arbor, MI; Stacey T. Gray, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how predictive modeling can be used to create assessment benchmarks for competency based surgical training in the field of otolaryngology.

Objectives: Competency based surgical education requires practical assessments and meaningful benchmarks. In otolaryngology, key indicator procedure (KIP) minima reflect benchmarks for surgical exposure during training, but it is unclear how to assess performance on KIPs or how many times trainees must be evaluated to ensure operative competence. Herein, we used mixed effects models to compute predicted performance expectations for KIPs. Study De-

sign: Multicenter retrospective analysis. Methods: From November 2017 to May 2021, a smartphone application (SIMPL OR) was used by attendings at five otolaryngology training programs to rate resident operative performance after each case on a five level scale. Bayesian mixed effects models were used to estimate the probability of a “practice ready” (PR) rating on a trainee’s future evaluation based on the number of prior PR assessments for the KIP, PGY level, and month of the academic year. Expected values were examined for interpretability, and cross validation was used to assess predictive validity. Results: 842 evaluations of KIPs were submitted by 72 attendings for 92 residents. The predictive model had an average area under the receiver operating curve of 0.77. The number of prior PR ratings that senior residents needed to predict a 95% probability of attaining a PR rating on a subsequent evaluation was estimated for each KIP. For example, for mastoidectomy, PGY4 residents needed to earn 9 PR ratings while PGY5 residents needed 4 PR ratings to have a 95% probability of attaining a PR rating on a following evaluation. Conclusions: Predictive modeling can inform assessment benchmarks for competency based surgical education.

11:35 **Comparison of Mechanical Force Used in Open Tracheotomy Versus Percutaneous Tracheotomy Techniques**

Ramya Bharathi, MD, Boston, MA; Gopikrishna Mitnala Rao, BS, Boston, MA; Jan Groblewski, MD, Providence, RI; Jeremiah Tracy, MD, Boston, MA; Maria Koenigs, MD, Providence, RI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the differences in techniques between open tracheotomy and percutaneous tracheotomy placement, the mechanical forces applied with each method, and the correlation with the risk of tracheal stenosis development.

Objectives: To understand the etiology of tracheotomy induced tracheal stenosis by comparing the differences in techniques and mechanical force applied with open tracheotomy (OT) versus percutaneous tracheotomy (PCT) placement. Study Design: Experimental randomized controlled study in an experimental model, unblinded. Methods: Simulated tracheostomies were performed on 10 porcine tracheas (5 via a tracheal window technique (OT) and 5 using the Seldinger technique (PCT). The applied weight during the simulated tracheostomy and the compression of the trachea were recorded during set times of the procedure. The applied weight during tracheostomy was used to calculate the tissue force in Newtons. Tracheal compression was measured by anterior-posterior distance compression and as percent change. The primary outcomes measured were the force (in Newtons) and the anterior-posterior (AP) tracheal lumen collapse. Results: Open tracheostomy required less force than the PCT. The average forces for scalpel (OT) versus trochar (PCT) were 2.6N and 12.4N ($p<0.01$), with the dilator (PCT) it was 22.019N ($p<0.001$). The tracheostomy placement with OT required an average force of 10.7 N versus 23.2N ($p=0.005$) with PCT. The average change in AP distance when using the scalpel versus trochar was 21%, and 44% ($p<0.0001$), with the dilator it was 75% ($p<0.0001$). The trach placement with OT versus PCT had an average AP distance change of 51% and 83% respectively ($p=0.01$). Conclusions: This study demonstrated that PCT required more force and caused more tracheal lumen compression when compared to the OT technique. Based on the increased force required for PCT, we suspect there is a higher risk of tracheal cartilage trauma and tracheal stenosis following PCT compared to OT.

11:40 **Investigating the Correlation Between Sjogren's Syndrome and Sialendoscopic Findings**

Jessica L. Bertram, BA, Memphis, TN; Chad Neiri, BS, Memphis, TN; Leighton Reed, MD, Memphis, TN; Marion Boyd Gillespie, MD MSc, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) distinguish clinical and histopathological findings in patients diagnosed with Sjogren's syndrome; 2) understand the clinical benefits of sialendoscopy in patients with Sjogren's syndrome; and 3) identify common features of endoscopic findings in chronic sialadenitis.

Objectives: To determine whether sialendoscopy findings correlate with open salivary tissue biopsies consistent with Sjogren's syndrome. Study Design: Single center retrospective case control study. Methods: Patients > 18 years old who underwent sialendoscopic intervention by one surgeon from June 2016 to June 2022 and were subsequently evaluated for Sjogren's syndrome (SS) via labial salivary gland biopsy. SS was diagnosed if biopsy findings reported a focus score ≥ 1 . Primary outcome measures were found in sialendoscopy operative notes and included location where dilation was performed, scarring, stenosis, mucus, webs, and dilations. Additional descriptive characteristics included demographics, presenting symptoms, caffeine or tobacco use, drying medications and level of improvement after sialendoscopy. Fisher's exact test was used to compare sialendoscopy findings and descriptive characteristics between SS+ and SS- groups. Results: The final cohorts included 23 SS+ and 22 SS- patients with a total of 37 glands in the SS+ and 40 glands in the SS- groups. SS+ were found to require dilation more proximally at significantly higher rates than SS- patients ($p = .0202$). However, there was no statistical difference in scarring, stenosis, mucus, or webs between each group. Conclusions: The outcomes of this present study suggest that sialendoscopy may provide additional evidence in support of Sjogren's syndrome in terms of location of required ductal dilation. Other endoscopic parameters may instead provide information about overall disease state for chronic sialadenitis. Future studies would benefit from correlating current grading systems based on the site of ductal stenosis to sialendoscopic findings in patients with Sjogren's syndrome.

11:45 **Negative Pressure Wound Therapy (NPWT) in the Management of Thyroidectomy Incisions**

Yuna Kim, MD, Las Vegas, NV; Emily Sagalow, MD, Las Vegas, NV (Presenter); Robert Wang, MD, Las Vegas, NV

Educational Objective: At the conclusion of this presentation, the participants should be able to assess the efficacy of NPWT in managing post-thyroidectomy incisions and preventing seroma formation.

Objectives: To assess the efficacy of NPWT in managing post-thyroidectomy incisions by comparing the rate of seroma. Study Design: Retrospective cohort study. Methods: The charts of patients that underwent thyroidectomy by two surgeons from a single institution from February 2018 to June 2022 were reviewed. All incisions were initially closed primarily. Patients that underwent primary closure only were compared to patients that underwent 1) drain insertion (10-Fr flat perforated Jackson-Pratt drain) 2) NPWT application (PREVENATM) 3) NPWT

application with catheter insertion (8-Fr catheter insertion into incision prior to NPWT application). The main outcome that was measured was number of post-operative seromas that formed. Results: 293 patients that underwent thyroidectomy were included in this study. The rate of seroma formation in each group was 22/117(18.8%) in patients with primary closure only, 1/30 (3.3%) with drain insertion, 13/129 (10.1%) patients with NPWT application, and 0/17 patients with NPWT application with catheter insertion. There was a significant decrease in seroma rate from primary closure in patients with NPWT with catheter insertion ($p < 0.05$). There was no significant difference in seroma rate between the drain and NPWT with catheter group. Conclusions: Utilization of NPWT with catheter insertion on post-thyroidectomy incisions offers a low maintenance dressing that is comparable and potentially more effective in preventing seroma formation in comparison to surgical drains.

11:50 Validation of Minimal Clinically Important Difference (MCID) for University of Pennsylvania Smell Identification Test (UPSIT)
Ashna Mahadev, MSCI, St. Louis, MO; Dorina Kallogjeri, MD, St. Louis, MO; Jay Piccirillo, MD, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the importance of minimal clinically important difference when planning studies and reporting clinically significant results; and 2) learn the two methods of calculating MCID: distribution based and clinical anchor based.

Objectives: To determine the MCID of UPSIT in patients with post-viral, sinusitis, or procedure associated olfactory loss. Study Design: This was a secondary analysis of prospectively collected data from five clinical research studies related to olfactory function. Methods: All subjects had completed a baseline and followup UPSIT, baseline and followup clinical global impression severity (CGI severity), and followup CGI improvement. Both distribution and anchor based methods were used to determine the MCID of UPSIT. Distribution based method calculated MCID using half standard deviation of baseline UPSIT scores and half standard deviation of delta UPSIT. Clinical anchor method determined MCID by comparing delta UPSIT scores between relevant clinical categories as determined by CGI improvement: very much better, much better, slightly better, no change, slightly worse, much worse, and very much worse. Results: The study population comprised 295 subjects. Subjects had a mean (SD) baseline UPSIT score of 27 (7.5), followup score 28 (7.9), and a mean UPSIT change of 0.6 (5.8). Half the baseline UPSIT SD was 3.75 and half the delta UPSIT SD was 2.9. With the anchor based approach, an MCID of 4 was defined as clinically meaningful by exploring the relationship between delta UPSIT and CGI improvement. Using a more conservative approach based on the MCID values identified from both methods, we determined that MCID for UPSIT was defined as a change of 4 or greater. Conclusions: This study found across a wide range of patients and clinical conditions, the MCID for UPSIT is 4 or greater. Investigators should use an MCID and report the percentage of subjects who achieve a clinically meaningful difference.

11:55 - 12:00 Q&A

12:00 - 12:55 PANEL
Incorporating New Technologies into Your Practice: A

Potpourri of Office Procedures, Biologics, Wearables, Sleep Trackers, OTC Hearing Aids

Moderator:

Maria V. Suurna, MD FACS, Miami, FL

Panelists:

Incorporating OTC Hearing Aids into Your Practice

Justin S. Golub, MD MS, New York, NY

Incorporating Biologics into the Treatment Algorithm for Chronic Rhinosinusitis

Stacey T. Gray, MD FACS, Boston, MA

Moving the OR into the Clinic: Office Based Laryngeal Procedures

Lindsay S. Reder, MD, Baldwin Park, CA

Current Trends and Future Developments in Sleep Apnea Treatment

Maria V. Suurna, MD FACS, Miami, FL

- 12:55 - 1:00 Q&A**
- 1:00 ADJOURN - Grab your lunch in the Courtyard and come back in for the afternoon sessions**
- 1:00 GOLF OUTING (pre-registration required)**
- 1:15 - 1:45 HOW TO BE AN EFFECTIVE PEER REVIEWER (pre-registration required) - Coronet Room**
Samuel H. Selesnick, MD FACS, New York, NY - Editor, Laryngoscope
- 1:45 - 2:30 TRIOLOGICAL THESIS SEMINAR (pre-registration required) - Continental Room**
Daniel G. Deschler, MD FACS, Boston, MA - Chair, Thesis Committee
- 1:45 - 3:15 RESIDENT BOWL (pre-registration required) - Crown Room**
Michael E. Hoffer, MD FACS, Miami, FL
Albert L. Merati, MD FACS, Seattle, WA
Stacey L. Ishman, MD MPH, Cincinnati, OH
Lamont R. Jones, MD MBA, Detroit, MI
Stacey T. Gray, MD FACS, Boston, MA
- 3:15 - 5:00 WOMEN IN OTOLARYNGOLOGY NETWORKING EVENT (open to all attendees) - Vista Terrace**

FRIDAY CONCURRENT SESSIONS 11:00 - 1:00

PEDIATRICS, LARYNGOLOGY/BRONCHOSOPHAGOLOGY SESSION H - CORONET ROOM

11:00 - 11:55 **PANEL**
From Bad to Worse: Button Battery Ingestion

Moderator:

Ian N. Jacobs, MD FACS, Philadelphia, PA

Panelists:

Alessandro de Alarcon, MD MPH, Cincinnati, OH

Romaine F. Johnson, MD MPH, Dallas, TX

Dana M. Thompson, MD FACS, Chicago, IL

11:55 - 12:00 **Q&A**

Moderators:

Nasir I. Bhatti, MD FACS, Baltimore MD

Megan L. Durr, MD FACS, Oakland, CA

12:00 **Hypogeusia and Hyposmia in Children Preceding Tonsillectomy**

Natalie Anne Kelly, BS, Columbus, OH; Kevin Liu, BS, Columbus, OH; Prasanth Pattisapu, MD MPH, Columbus, OH; Tendency Chiang, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the incidence of hypogeusia and hyposmia in the pediatric population before tonsillectomy.

Objectives: Despite the overall safety of the tonsillectomy, cases of postoperative dysgeusia have been reported. The aim of our study was to evaluate baseline glossopharyngeal taste in the pediatric population before tonsillectomy, to support ongoing studies on taste disturbances after the procedure. Study Design: A prospective study at a tertiary level pediatric hospital from March through July 2022. Methods: The taste and smell of 20 children, age 4-18 who were recommended for tonsillectomy, were evaluated before surgery. Smell testing was performed with the National Institutes of Health Toolbox Odor Identification Test, while taste testing used validated Taste Strips (Berghart). COVID-19 history and symptoms were documented. Demographic data and indications for surgery were gathered from chart review. Results: The mean age of the 20 children was 8 +/- 3 years, 7 (35%) were female, and 18 (90%) were white. Indications for surgery included: snoring (n=9), recurrent tonsillitis (n=1), adenotonsillar hypertrophy (n=10), obstructive sleep apnea (n=1), tonsillar hypertrophy (n=10), mouth breathing (n=1), and sleep disordered breathing (n=6). Five (25%) children previously tested positive for COVID-19, however no legal guardians reported COVID-19 symptoms on the day of the testing. Sixteen (80%) children had normal taste test results. Sweet was correctly identified 85% of the time, bitter 63%, salty 53%, and sour 53%. Eleven (55%) children successfully passed the smell testing. Conclusions: While dysgeusia is a possible risk of tonsillectomy, a portion of the population may have taste disturbances prior to surgery without a previous medical history.

12:05 **Assessing Quality and Performance of Tracheostomy Hospital Stays Using the "Tracheostomy Scorecard"**

Jenny Kim, BA, Dallas, TX; Stephen R. Chorney, MD MPH, Dallas, TX; Yann-Fuu Kou, MD, Dallas, TX; Helene Dabbous, MD, Dallas, TX;

Romaine F. Johnson, MD MPH, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to apply to the “tracheostomy scorecard” to their pediatric tracheostomy quality and safety metrics.

Objectives: Stays for tracheostomy have the highest aggregate cost of all pediatric stays in 2016 despite representing just 4% of hospitalizations. Tracheostomy patients’ high cost and resource utilization represent a unique opportunity for quality improvement and cost reductions. Our goals were to develop a report card to help analyze performance and cost for tracheostomy patients among hospitals participating in the Pediatric Health Information System (PHIS). **Study Design:** Retrospective cohort. **Methods:** Children who underwent tracheostomy between January - December 2021 from 45 Pediatric Health Information System hospitals were included. Children were categorized by age and disease complexity (major cardiac procedure, sepsis, total parental nutrition). The quality metrics in the report card included assessments of swallowing, speech, hearing, length of index stay (LOS), tracheostomy related complications, 30 day all cause revisit rates (admission or emergency room), and the total costs. **Results:** The scorecard recorded 1,327 tracheostomies performed in 2021 among PHIS hospitals; 58% occurred in children under two years old. The average postoperative LOS was 57 days, and 63% had a speech language evaluation. The trach related complication rate was 14%, and the 30 day all cause revisit rate was 32%. The trach specific revisit rate was 3.9%. The average cost for index visits was \$1 074 739 for complicated patients and \$342K for uncomplicated patients. The data showed significant variation between hospitals in all measured metrics. **Conclusions:** This report card was developed to aid hospitals in developing best practices for improving tracheostomy outcomes. These metrics represent a roadmap for process improvement and program development.

12:10 IMPACT of Motorization on Craniofacial Injury Patterns with Children’s Recreational Conveyances

Scott Hirsch, MD, Aurora, CO; Tammy Wang, MD, Denver, CO; Scott Mann, MD, Denver, CO

Educational Objective: At the conclusion of this presentation, the participants should be able to identify how the addition of motors on children’s recreational conveyances impacts the severity of injuries and patterns of craniofacial fractures.

Objectives: To determine the impact of motorization on severity of injuries and frequency of craniofacial fractures with children’s recreational conveyances (RCs). **Study Design:** Retrospective review using the National Electronic Injury Surveillance System (NEISS) from the Consumer Product Safety Commission. **Methods:** Injuries involving childhood RCs were collected for patients under 19 years old. Subset analysis was performed to determine differences in injury patterns of calvarial and facial fractures between types of RCs. **Results:** 14,262 encounters were examined; 6,076 (42.6%) related to scooters (median age 6.0 years), 5,211 (36.5%) to skateboards (median age 13.0 years), and 2,975 (20.9%) to other RCs (median age 2.0 years). Significant differences in age, sex, race, and helmet use existed between RC types. No difference in serious injury, facial fracture, or skull fracture frequencies differed between motorization of skateboards and other RCs, however, motorized scooter traumas were sig-

nificantly more likely to result in serious injuries (OR 2.19; 95% CI 1.32-3.62; $p=0.003$) and facial fractures (OR 2.79; 95% CI 1.35-5.75; $p=0.007$). Motorized scooter traumas were also more likely to involve vehicle collisions (OR 5.8; 95% CI 4.2-8.0; $p<0.001$). Helmet use was associated with fewer serious injuries (OR 0.5; 95% CI 0.33-0.76; $p<0.001$) and skull fractures (OR 0.11; 95% CI 0.03-0.35; $p<0.001$) but more facial fractures (OR 1.61; 95% CI 1.03-2.52; $p=0.011$). Conclusions: No difference existed between motorization of skateboards and other RCs but adding a motor to scooters resulted in more serious injuries and facial fractures. Helmet use with any RC protected against calvarial fractures and serious injuries, but increased risk of facial fractures.

12:15 Histologic Examination of Vocal Fold Mucosal Wave Origin and Propagation

Hye Rhyn Chung, BS, Los Angeles, CA; Neha K. Reddy, BA, Los Angeles, CA; Daniel Manzoor, MD, Los Angeles, CA; Dinesh K. Chhetri, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize histologic structures and patterns of the mucosal wave origin of the vocal fold.

Objectives: During phonation the mucosal wave on the vocal fold originates on the medial surface and propagates superiorly. The origin of the mucosal wave can be observed from an inferior or medial surface view of the vibrating vocal fold. The vocal fold histology that corresponds to mucosal wave dynamics is of interest. The purpose of this study is to correlate histologic features of the vocal fold in relation to mucosal wave origin and propagation. Study Design: In vivo canine hemilarynx phonation. Methods: An in vivo canine hemilarynx was phonated against a glass prism and the vibration was captured using high speed video of the medial surface. The origin of the mucosal upheaval was located and its relationship to tattooed landmarks recorded. Histologic examination of the hemilarynx was performed. Results: The distance between the vocal fold epithelial layer and the body muscle layer reached a minimum at the origin of mucosal upheaval. The lamina propria originated at this location and its thickness gradually increased superiorly. Mucous glands were present in the subepithelial layer inferior to the origin but not above. Elastic fibers were seen parallel to the basement membrane, oriented transversely and longitudinally. Elastic fibers were fewer but denser in the longitudinal axis. A muscle fiber size distinction could be made between the lateral thyroarytenoid and the medial vocalis muscles. Conclusions: Histologic examination of the vocal fold reveals structural patterns of the origin of mucosal upheaval during phonation, unveiling a relationship between histology and laryngeal dynamics.

12:20 In-office Intralesional Steroid Injection for Subglottic Stenosis

Claire Gleadhill, MD, Tucson, AZ; Aaron Done, MD, Sacramento, CA; Helena T. Yip, MD, Tucson, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of in-office steroid injection for the management of subglottic stenosis.

Objectives: Subglottic stenosis is typically treated with surgical serial dilations or tracheal resection. Emerging data suggest office based serial intralesional

steroid injections are an effective, less invasive treatment alternative or adjunct. The goal of this study was to describe outcomes after in-office injections for subglottic stenosis. Study Design: Retrospective case series of patients with subglottic stenosis treated with serial in-office injections from 2018 to 2022. Methods: Medical charts of 12 patients with subglottic stenosis who underwent serial in-office injections as primary treatment or after previous OR dilation were reviewed. Transcervical injections of Kenalog using a hypodermic 22G needle were performed into the stenosis under flexible laryngoscopic guidance after 4% topical lidocaine anesthesia and bilateral SLN blocks. Treatment efficacy was determined by assessment of exercise tolerance, symptom relief, and need to return to the OR. Results: Seven patients (58.3%) with multiple previous OR dilations (range, 2-6 dilations) had serial in-office injections as their sole management, which successfully maintained patency of their airway with increased exercise tolerance and symptomatic relief (mean followup, 24 months). Two patients (16.7%) were managed initially with in-office injections (three and six injections) over 18 months before dyspnea worsened and dilation in OR was performed. Three patients (25%) with multiple previous dilations received two in-office injections but subsequently required tracheal resection. Conclusions: Serial in-office intralesional steroid injections are an effective nonsurgical treatment adjunct for patients with subglottic stenosis to stabilize disease and decrease the need for OR interventions.

12:25 - 12:30 Q&A

Moderators:

Natasha Mirza, MD FACS, Philadelphia, PA

12:30 The Cost Effectiveness of Serial Intralesional Steroid Injections for Prolonging the Surgery Free Interval in Subglottic Stenosis Patients

Jake A. Langlie, BS, Miami, FL; Luke Pasick, MD, Miami, FL; David Edward Rosow, MD, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the cost effectiveness of serial intralesional steroid injections for prolonging the surgery free interval in subglottic stenosis patients.

Objectives: Repeat endoscopic dilation (ED) in the operating room for subglottic stenosis (SGS) remains an economic burden to patients and the healthcare system. The cost effectiveness (CE) of serial intralesional steroid injections (SILSI) to prolong the surgery free interval (SFI) in SGS patients requiring ED has yet to be studied. Study Design: An analytical observational study of data from the literature and our institution. Methods: SFI, cost of intervention, and the effect of SILSI on prolonging SFI were collected from the literature. Cost of SILSI and ED were received from our tertiary academic center and Medicare allowable rates. SGS etiologies included idiopathic, traumatic, or autoimmune. Average extension of the SFI with SILSI was an additional 140-380 days (4.6-12.5 months) compared to ED alone based on the literature. A break even analysis was performed to determine if SILSI injections were CE in prolonging the SFI. Results: SILSI administered in a 3 dose series in 3 to 6 week intervals (~\$900 for Medicare; ~\$5673 academic setting) is CE if the reported annual recurrence rate of SGS requiring ED (~\$8,500 Medicare; ~\$39,221 academic setting), ranging

from 26.8%-43.5%, has an absolute risk reduction of at least 10.59-14.46% with the use of SILSI. SILSI prevents one out of every 2 to 4 cases of SGS annually from undergoing ED, resulting in an ARR of 25-50%. Conclusions: SILSI is economically justified if it prevents at least one case of recurrence out of 7 (academic setting) - 9 (Medicare) annually. SILSI can be CE in extending the interval for surgical ED independent of the underlying etiology of SGS.

12:35 Complications Associated with Autologous Costal Cartilage Harvest in Pediatric Laryngotracheal Reconstruction: A Systematic Review

Christian X. Lava, MS, Washington, DC; Taylor S. Martin, MS, Washington, DC; James A. Leonard, MD, Washington, DC; Daniel L. Blumenthal, MD, Washington, DC; Kelly Scriven-Weiner, MD, Washington, DC; Earl H. Harley, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand 1) the postoperative complications that can occur at the donor site with autologous costal cartilage grafting for pediatric laryngotracheal reconstruction (LTR); and (2) management strategies.

Objectives: We aim to determine the donor site complication rates associated with autologous costal cartilage graft harvest for pediatric LTR. Secondly, we aim to identify risk factors associated with donor site complication rates, as well as evaluate management strategies. Study Design: This study is a systematic review, which adheres to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Methods: An electronic database search of Ovid Medline, Ovid EMBASE, and PubMed was completed for articles pertaining to complications in autologous costal cartilage harvest for pediatric LTR. The study characteristics, operative information, and patient demographics were collected. The data concerning postoperative complications, risk factors, and management strategies were collected and analyzed for patterns. Results: A total of 31 manuscripts representing 745 patients were included for analysis. The reported donor site complications included pneumothorax (n = 13, 1.74%), pleural tear (n = 5, 0.67%), infection (n = 8, 1.07%), and scar related problems (n = 2, 0.26%). There were no reported cases of seroma, persistent pain, or chest wall deformity. Only 5 studies discussed the management of donor site complications, with intervention in 11 (39.28%) patients including chest tube drainage and steroid injection. Conclusions: There is significant variability in the literature regarding complication rates in autologous costal cartilage harvest for pediatric LTR. This study provides a comprehensive review of different complications with different surgical techniques. The incidence of major postoperative complications is low and supports the use of autologous costal cartilage as graft material for pediatric LTR.

12:40 Choice of Suture Technique May Mitigate Figure of 8 Deformity in Slide Tracheoplasty

Cedric Dewayne Sheffield, MS, Boston, MA; Andrew Richardson Scott, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand figure of 8 deformity is an immediate and potentially life threatening intraoperative complication following slide tracheoplasty for

congenital tracheal stenosis. There has not been a commonly accepted way for a surgeon to prevent this complication, which is usually immediately apparent on intraoperative bronchoscopy prior to coming off bypass. We illustrate to the learner that a figure of eight deformity occurs because of undesirable forces on the tracheal suture lines that are generated when using a simple running closure and this deformity may be preventable using alternative methods.

Objectives: To demonstrate varying degrees of immediate postoperative figure of 8 deformity following three different methods of tracheal suturing. **Study Design:** Comparative ex-vivo study. **Methods:** A fresh, unfixated rabbit trachea was harvested and bisected at its midpoint. The posterior membranous trachea was excised from both segments to mimic the anatomy of complete tracheal rings following longitudinal release. A slide tracheoplasty was performed on the same tracheal segments as an internal control, using three different methods of closure. Endoscopic and external photographs were taken to document the result on external and endoluminal anatomy. **Results:** A simple running closure, when traveling occurs between needle passes, showed the most evidence of figure of 8 deformity. A running horizontal mattress suture showed a significant improvement and a modified running closure, when traveling occurs within needle passes, showed the least deformity. **Conclusions:** Our study suggests that a minor modification of standard running closure techniques may help prevent figure of 8 deformity.

12:45 **Epithelial Reparative Potential May Determine the Success of Airway Reconstruction**

Lisa Zhang, MD, Columbus, OH; Natalie Kelly, Columbus, OH; Kim Shontz, MS, Columbus, OH; Laura Matrka, MD, Columbus, OH; Susan D. Reynolds, PhD, Columbus, OH; Tendy Chiang, MD, Columbus, OH

Educational Objective: Preclinical studies demonstrate that tissue engineered trachea (TET) have the potential to serve as replacement tissue for human airway reconstruction. However, most tracheal replacements rely on the host to re-epithelize the graft. Since candidates for tracheal replacement surgery have significant airway anomalies, the reparative potential of the epithelium may also be abnormal.

Objectives: To improve understanding of host reparative potential of human primary tracheobronchial epithelial cells (hTBEC) in vitro. **Study Design:** Retrospective case control. **Methods:** hTBEC were obtained by brushing the mucosa during clinically indicated bronchoscopy. Clinical and demographic features were recorded, including history of tracheostomy dependence and laryngotracheal stenosis. Cells were harvested and cultured using established methods. Basal cell phenotype was quantified by flow cytometry and immunostaining for basal cell markers. Stem cell number was quantified using clone forming cell frequency, and multi-lineage differentiation was assayed using the air-liquid-interface differentiation method. **Results:** Airway epithelial cells were obtained from 42 pediatric patients and three adults. 42 pediatric samples were recovered from morphologically normal airway regions and 15 from regions of laryngotracheal pathology. Adult samples were recovered from involved and noninvolved regions. Two pediatric samples (5%) exhibited squamous cell metaplasia after initial harvest, or passage 0. In contrast, two (67%) adult samples, including those from both the normal and damaged mucosa, exhibited squamous cell metaplasia at passage 0. Two adult patients had a prior history of tracheostomy depen-

dence and one had idiopathic subglottic stenosis. Conclusions: Our preliminary results introduce the variability of regenerative potential of the tracheobronchial epithelium in humans. Additional studies are needed to better elucidate the role stem cell function on tracheal neotissue formation.

12:50 Comparison of Recurrent Laryngeal Evoked Studies in Young and Aged Rats

Hans C. Baertsch, BA, Los Angeles, CA; David J. Cvancara, BS, Seattle, WA; Neel K. Bhatt, MD, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe how to perform laryngeal evoked study upon stimulation of the recurrent laryngeal nerve; 2) understand the measured physiologic and anatomical properties of the recurrent laryngeal nerve and how they compare across age; and 3) be oriented to the future use of laryngeal evoked studies for investigation of age related vocal atrophy and laryngeal reinnervation.

Objectives: Age related vocal atrophy (ARVA) is associated with dysphonia and contribute to reduced quality of life. The present study utilizes laryngeal evoked studies (LEvS) to determine if neuromuscular changes occur in the aging larynx using an aging rat model. Study Design: Animal study. Methods: In vivo LEvS were performed in 10 young hemilarynges (3-4 months) and 10 aged hemilarynges (18-19 months) rats (Fischer 344xBrown Norway F344BN). Recording electrodes were placed into the thyroarytenoid (TA) muscle via direct laryngoscopy. Recurrent laryngeal nerves (RLNs) were stimulated 5mm below the cricoid cartilage with bipolar electrodes. Compound motor action potentials (CMAPs) were obtained. RLN cross-sections were stained with toluidine blue. Axon count, myelination, and g-ratio were quantified utilizing AxonDeepSeg analysis software. Results: LEvS were successfully obtained in all animals. Mean CMAP amplitude and negative durations in young rats were 3.57 +/- 2.2mV and 0.93 +/- 0.14mS, respectively, and 3.74 +/- 2.8mV and 0.98 +/- 0.11mS, respectively, in aged rats and did not significantly differ between groups. No significant differences in onset latency or negative area were observed. Mean axon count in young rats (175.6 +/- 35.2) was comparable to that in old rats (172.9 +/- 31.1). Myelin thickness and g-ratio did not differ between groups. Conclusions: LEvS are a feasible and reliable technique for measuring neuromuscular properties of the larynx. Although age related neuromuscular changes in the larynx were not significantly different at 18 months compared to 4 months, future studies utilizing a larger sample size or older rats may identify age related laryngeal changes. This work could lead to the development of a tractable animal model for study of ARVA.

12:55 - 1:00 Q&A

1:00 ADJOURN - Grab your lunch in the Courtyard and come back in for the afternoon sessions

1:00 GOLF OUTING (pre-registration required)

1:15 - 1:45 HOW TO BE AN EFFECTIVE PEER REVIEWER (pre-registration required) - Coronet Room
Samuel H. Selesnick, MD FACS, New York, NY - Editor,

Laryngoscope

1:45 - 2:30

TRIOLOGICAL THESIS SEMINAR (pre-registration required) - Continental Room

Daniel G. Deschler, MD FACS, Boston, MA - Chair, Thesis Committee

1:45 - 3:15

RESIDENT BOWL (pre-registration required) - Crown Room

Michael E. Hoffer, MD FACS, Miami, FL
Albert L. Merati, MD FACS, Seattle, WA
Stacey L. Ishman, MD MPH, Cincinnati, OH
Lamont R. Jones, MD MBA, Detroit, MI
Stacey T. Gray, MD FACS, Boston, MA

3:15 - 5:00

WOMEN IN OTOLARYNGOLOGY NETWORKING EVENT (open to all attendees) - Vista Terrace

SATURDAY, JANUARY 28, 2023

- 6:30 - 7:15** **BUSINESS MEETINGS (Fellows Only)**
EASTERN SECTION - Garden Room
MIDDLE SECTION - Continental Room
- 7:15 - 8:15** **BREAKFAST FOR ATTENDEES - Ocean Ballroom**
- 7:30** **NEW FELLOWS RECEPTION (Fellows Only) - Crown Room**

GENERAL SESSION - 8:15 - 9:30 - CROWN ROOM

- 8:15** **Announcements and Introduction of Section Vice President Elects by Section Vice Presidents**
Eastern Section - Robert M. Kellman, MD FACS
Middle Section - J. Paul Willging, MD
Southern Section - Cherie-Ann Nathan, MD FACS
Western Section - Maie A. St. John, MD PhD FACS
- 8:20 - 9:20** **PANEL**
Practicing in the New World - Corporate Consolidation of Otolaryngology Practices; Patient/Family Experience Measures; Incorporating APPs; Bridging the Generation Gap Between Older and Younger Colleagues
Moderator:
J. Paul Willging, MD FACS, Cincinnati, OH
Panelists:
Cherie-Ann Nathan, MD FACS, Shreveport, LA
Melin Tan-Geller MD, White Plains, NY
Peter A. Weisskopf, MD FACS, Phoenix, AZ
Chad A. Zender, MD FACS, Cincinnati, OH
- 9:20 - 9:30** **Q&A**
- 9:30 - 10:00** **BREAK WITH EXHIBITORS/VIEW POSTERS - Ocean Ballroom**

SATURDAY CONCURRENT SESSIONS 10:00 - 12:30 **GENERAL & HEAD & NECK SESSION I - CROWN ROOM**

- Moderator:**
Steven S. Chang, MD FACS, Detroit, MI
- 10:00** **Otolaryngology Cancer Research Training Program Associated with Academic Success for Medical Trainees**
Andrew Christopher Elton, BS, Minneapolis, MN; Beverly Wuertz, BA, Minneapolis, MN; Frank G. Ondrey, MD PhD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, participants should be able to recognize the impact of unique basic science otolaryngology research training models on metrics of academic success in medical training.

Objectives: To analyze academic success metrics of otolaryngology cancer research laboratory trainees. Study Design: Retrospective analysis of trainee academic outcomes from 2000-2020. Methods: We examined careers of 99 trainees of the senior author's laboratory, including undergraduates, medical students, otolaryngology residents/fellows, and NIH T32 postdocs. We compared medical school matriculation rates, otolaryngology match rates, fellowship match rates, publication rates and academic positions with publicly available data from the AAMC, NRMP and others. Results: 9 undergraduates achieved a 100% medical school matriculation rate compared to the AAMC rate of 43.4% ($p=3.45E-27$). Of 22/53 medical students who applied to otolaryngology residency, students achieved a 100% match rate, compared to the NRMP match rate of 82.1% ($p=1.70E-06$). Of 33 medical students who completed training, 45.4% ($n=15$) became academicians, compared to 44.9% ($n=216$, $p=0.95$ NS) in a comparison cohort. Interestingly, medical student trainees overall had more publications compared to incoming otolaryngology residents ($p=1.49E-25$, $n=50$). Our residents achieved a 100% fellowship match rate compared to 79.0% average match rate across the NRMP, AHNS, and SF otolaryngology fellowship matches ($p=0.28$, $n=11$). 12/25 (48%) residents earned advanced degrees (10 MS, 2 PhD), which was statistically significant compared to incoming otolaryngology residents via the NRMP data ($p=8.42E-07$, $n=25$). 20% of residents and 60% (3/5) of surgical fellows entered academics with two becoming department chairs. Conclusions: We observed multiple benefits from bench lab experience at all levels of academic training, specifically medical school and otolaryngology residency matriculation and academic faculty placement of former trainees.

10:05 **Investigating Adherence of Referring Providers to Clinical Practice Guidelines for Neck Mass in Adults**

Grace A. Hagan, BS, Kansas City, KS; Andres Bur, MD, Philadelphia, PA; Nathan Farrokhan, MD, Cleveland, OH; Hanna Moradi, BS, Lawrence, KS; Molly Bollman, BA, Lawrence, KS; Logan McKinney, BA, Liberty, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the importance in adhering to clinical practice guidelines for adults with a neck mass to prevent referral and treatment delays in the management of head and neck cancer patients.

Objectives: Although clinical practice guidelines (CPG) were designed to improve the management of adults presenting with a neck mass, many patients present to head and neck cancer (HNC) clinics with late stage disease. We analyze adherence to CPG action statements against the duration of time between initial presentation with referring provider to HNC clinic presentation and treatment initiation. Study Design: This is a retrospective chart review of 222 patients from a single institution that were diagnosed from 2015-2021. Records were analyzed to investigate adherence to the CPG. Methods: Two action statements were followed: avoidance of antibiotics and obtaining an FNA. Referral time (RT) defined duration between initial presentation to presentation at the HNC clinic and treatment time (TT) defined that to treatment initiation. Results: Two action statements were followed: avoidance of antibiotics and obtaining an

FNA. The criteria were met by 94/222 patients, 17% of which were inappropriately prescribed antibiotics and 15% had an excisional biopsy. The respective z scores for RT and TT by obtaining an FNA prior to excisional biopsy were -1.811 ($p = 0.11$) and -1.691 ($p = 0.07$), and those by avoidance of antibiotics were -2.496 ($p = 0.01$) and -2.017 ($p = 0.04$). Conclusions: Inappropriate use of antibiotics in these patients causes significant delays in both RT and TT. We did not find significance for those who had an excisional biopsy prior to FNA; however, non-indicated biopsies may result in complications or worse oncologic outcomes. CPG should be utilized to improve efficiency and efficacy of patient management. Inappropriate use of antibiotics significantly delays referral and treatment for HNC patients presenting with a neck mass.

10:10 **The Price of Education: Implications of the RVU Compensation Model in Academic Head and Neck Surgery**

Michael Chow, MD, New York, NY; Alex Gordon, BS, New York, NY; Ahbinav Talwar, BS, Chicago, IL; Bevan Yueh, MD MPH, Minneapolis, MN; William Lydiatt, MD, Omaha, NE; Babak Givi, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the utilization of the relative value unit as a productivity metric in academic head and neck surgery.

Objectives: Assess the potential opportunity cost of resident and fellow education in a relative value unit (wRVU) based compensation model. Study Design: A 2005-2015 review of ablative head and neck surgical procedures were performed using the National Surgical Quality Improvement Program (NSQIP). Work relative value units (wRVU) generated per hour were compared among procedures performed by attendings alone, attendings with residents, and attendings with fellows. Methods: The average wRVU per hour were compared among procedures staffed by attendings alone, attendings with fellows, and attendings with residents. Multiple linear regressions were used to adjust for patient variables, anesthetic, subtypes of H&N procedures (e.g., endocrine, salivary, mucosal) and complexity of surgery. Analyses were repeated after stratification by subtype of H&N procedures and by operative complexity. Results: Among all 34,078 procedures, the rate of wRVU generation per hour was greatest when cases were done by attendings alone (10.3), followed by attendings with residents (8.9) and attendings with fellows (7.0, p less than 0.001). When controlling for patient characteristics and operative complexity, resident and fellow involvement was associated with reductions of 1.8 RVU/hour (\$60.44 per hour) (95% CI: \$50.21-\$70.66/hour, p less than 0.001) and 2.3 RVU/hour (\$78.98 per hour) (\$63.10-\$94.87/hour, p less than 0.001), respectively. The greatest impact was seen in larger, complex H&N procedures. Conclusions: Productivity (as measured by wRVU/hour) may be reduced during teaching cases. We intend to pursue further work to understand whether an wRVU based compensation model efficiently rewards the effort involved in educating trainees in head and neck surgery.

10:15 **Discharge Disposition after Head and Neck Microvascular Reconstruction: Effect on Treatment Package Time and Perioperative Outcomes**

Sophia Dang, MD, Pittsburgh, PA; Terral Patel, MD, Pittsburgh, PA; Isabella Lao, BS, Pittsburgh, PA; Shaum S. Sridharan, MD, Pittsburgh, PA; Mario G. Solari, MD, Pittsburgh, PA; Mark W. Kubik, MD,

Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify risk factors and evaluate effect of disposition on delays in adjuvant treatment.

Objectives: Head and neck cancer that require major reconstruction often have advanced stage disease. Discharge disposition (home or skilled nursing facility [SNF]) of patients can vary and impact the time to adjuvant treatment. The objective of this study is to examine outcomes in patients discharged to SNF compared with those discharged home. **Study Design:** Retrospective cohort study. **Methods:** Patients with head and neck squamous cell carcinoma treated with surgical resection and microvascular free flap reconstruction from 2019-2022 were included. Retrospective review of variables was used to study the impact of disposition on time to radiation (RT) and total package time (TPT). **Results:** 230 patients were included, with 165 (71.7%) discharged to home and 65 (28.3%) discharged to SNF. 81.5% of SNF patients received adjuvant RT compared to 78.2% to home patients. Average time to RT was 70.1 days for SNF patients compared to 59.0 days for those discharged home ($p=.007$). TPT was 112.3 days for SNF, 101.7 days home ($p=.005$). There was no significant difference in RT of < 6 weeks (8.5% home, 5% SNF), $p=.48$. **Conclusions:** Patients discharged to a SNF went on to adjuvant treatment at a significantly delayed rate and have significantly longer TPT. Delays to adjuvant treatment are associated with worse disease outcomes, overall survival, and higher recurrence rates. Patients who are discharged to SNF are older, have higher frailty scores and comorbidities. When controlled for these variables, SNF patients still have higher rates of readmission and ED visits, as well as worse time to RT.

10:20 **The Impact of Dementia on the Postoperative Outcomes in Head and Neck Cancer: A National Study**

Rema Anisha Kandula, MD, Shreveport, LA; Grant Borne, BS, Shreveport, LA (Presenter); Tara Moore-Medlin, BS, Shreveport, LA; Sandeep Kandregula, MD, Shreveport, LA; Cherie-Ann O. Nathan, MD, Shreveport, LA

Educational Objective: Our study aims to establish if dementia plays a role in the outcomes of head and neck cancer patients that undergo resections.

Objectives: Dementia, a growing concern among the elderly, has increased poor postoperative outcomes, which go unrecognized by many. Our study aims to establish if dementia plays a role in the outcomes of head and neck cancer patients that undergo resections. **Study Design:** Retrospective. **Methods:** We queried the National Inpatient Sample (NIS) database from 2016 to 2019 for adult patients with a primary diagnosis of head and neck cancer who underwent surgical resection during their hospital stay. They were categorized based on the presence or absence of dementia. Outcomes analyzed included postoperative delirium, ICU stay, complications, extended length of stay (ELOS), and non-routine discharge (NRD). **Results:** A total of 62,070 patients underwent resection. Of which 1080 had dementia. Patients with dementia were older (mean, 77.9 +/- 9 vs. 63.1 +/- 12.6 years), had a higher non-routine discharge rate (75.9% vs. 41.3%), longer hospital stays (mean, 11 +/- 14.5 vs. 7 +/- 7.9), higher post-operative delirium (15.3% vs. 1.5%), and longer ICU stay (7.9% vs. 5.4%) (all $p < 0.001$) as compared to patients without dementia. A higher number of pa-

tients with dementia were discharged to long term facilities (53.7%) vs. home discharges (58.7%) for patients without dementia. Dementia patients were more likely to be transferred (7.9%) from another healthcare facility for surgery vs. patients without dementia (0.9%) ($p < 0.001$). When controlling for age, gender, race, insurance, hospital factors, and other complications, dementia was independently associated with delirium (OR, 7.37; 95% CI, 4.7-11.5), NRD (OR, 3.3; 95% CI, 2.3-4.6), ICU stay (OR, 1.11; 95% CI, 0.6-1.9), and ELOS (OR, 1.9; 95% CI, 1.3-2.6) (all $p < 0.001$) Conclusions: Preoperative dementia significantly impacts postoperative delirium, non-home discharge, and extended length of stay in head and neck cancer patients undergoing surgery.

10:25 - 10:30 Q&A

Moderator:

Gregory A. Grillone, MD FACS, Boston, MA

10:30 Impact of Neck Dissection in T3/T4 Mucoepidermoid Carcinoma of the Oral Cavity and Oropharynx

Rushi Patel, BA, Newark, NJ; Christopher Tseng, MD, Newark, NJ; Soly Baredes, MD, Newark, NJ; Richard Park, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate the benefit of neck dissection in oral cavity mucoepidermoid carcinoma.

Objectives: Previous research has reported high occult nodal metastases rates for T3/T4 mucoepidermoid carcinoma (MEC) of the oropharynx (OP) and oral cavity (OC). Our study evaluates if there is a benefit of neck dissection (ND) in these patients. Study Design: Retrospective database review. Methods: The 2004-2016 National Cancer Database was queried for all cases of adult MEC of the OC and OP. Patients with clinical T3/T4 disease were included while those with metastatic disease were excluded. Patients were split into two cohorts: those treated with and without ND. Results: A total of 243 patients met inclusion criteria, of which 79 (32.5%) underwent ND. The majority of patients were less than 60 years old (60.1%), white (76.2%), and male (53.5%). 37.9% of the entire cohort had clinically node positive (cN+) disease. ND patients had higher rates of cN+ disease (53.2% vs. 30.5%, $p=0.002$). Of patients receiving ND, 35 (44.3%) were clinically node negative (cN0) while 42 (53.2%) had cN+ disease. ND patients more commonly had grade III/IV tumors (45.1% vs. 23.4%, $p=0.002$). Upon examination of regional nodes, 25.5% of cN0 patients undergoing ND were found to have occult nodal metastases. There was no significant difference in 5 year overall survival between patients with and without ND (61.8% vs. 53.6%, $p=0.61$). Conclusions: Patients with MEC of OC and OP have a high rate (25.5%) of nodal upstaging upon examination of lymph nodes after ND. In this cohort, patients with ND were not found to have improved survival; however, this may be due to statistical underpowering.

10:35 Mandibular Osteoradionecrosis: Insight into the Microorganisms Cultured at the Time of Rescue Flap Surgery

Khashayar Arianpour, MD, Cleveland, OH; Sara Liu, MD, Cleveland, OH; Peter Ciolek, MD, Cleveland, OH; Brandon L. Prendes, MD, Cleveland, OH; Michael A. Fritz, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to describe most common microbiological and antibiotic sensitivity profiles of mandibular osteoradionecrosis.

Objectives: To report the microorganisms and their antibiotic sensitivity profile from tissue cultures and stains at time of anterolateral thigh fascia lata (ALT-FL) rescue flap for the management of mandibular osteoradionecrosis (ORN).
Study Design: Retrospective chart review. **Methods:** Electronic medical records of patients who underwent ATLFL rescue flap for native mandibular ORN between 2011 and 2022 were reviewed for intraoperative culture outcomes and antibiotic sensitivity profiles. **Results:** Twenty-six cases comprising 24 patients (mean age 65.4 years, 65.4% male) with mandibular ORN from whom tissue cultures and gram stain were obtained at the time of ATLFL. Of all specimens, 57.7% grew bacterial species while 34.6% grew fungal species. Multibacterial species were noted in 26.9% of cultures. A combination of bacterial and fungal growth was also seen in 15.4% of cases. A list of cultured species is provided in table 1. Gram positive cocci (GPC) species isolated (53.8% of cases) include streptococcus sp. (50.0%), staphylococcus sp. (35.7%) and *Rothia* sp. (14.3%). All GPC were pansensitive to antibiotics except one case of staphylococcus aureus which was resistant to levofloxacin. Of gram negative bacilli (GNB) species isolated (50.0% of cases), the most common were klebsiella sp (30.8%) and *Escherichia coli* (15.4%). All fungal growth was due to candida species, 77.7% of which were specifically candida albicans. Of 26 cases, no growth was noted across all culture specimens in 23.1% of cases. When performed, all acid fast bacilli culture and stain were negative for growth. Similarly, when performed, all anaerobic testing was negative for bacteroides fragilis and clostridium perfringens. Multi-drug resistance was noted in 53.8% of cases when GNB was isolated. The most frequent antibiotic resistance was noted to be ampicillin and ceftazolin (31.2% each, n = 16). **Conclusions:** We report a 76.9% of microorganism growth in mandibular ORN from tissue cultures obtained at time of ATLFL rescue flap. Fungal growth was noted in a substantial number of cases and should be obtained as a specimen when pursuing culture driven antibiotic therapy. The vast majority of GPC were pansensitive to antibiotics while GNB were often the harbinger of multi-drug resistant mandibular ORN.

10:40 **Greater Saphenous Vein Graft Harvest from Existing Anterolateral Thigh Incision**

Kevin Y. Liang, MD, Cleveland, OH; Dane J. Genther, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the anatomy of the greater saphenous vein and be aware of its utility for vein grafting in the head and neck.

Objectives: The anterolateral thigh (ALT) free flap is a versatile option for head and neck reconstruction. The greater saphenous vein (GSV) is a large caliber lower extremity vein commonly used for coronary bypass surgery. We describe a case of harvesting the GSV through an existing ALT incision without the need for additional incisions for two microvascular vein grafts in a previously operated and irradiated neck. **Study Design:** Case report. **Methods:** Retrospective chart review. **Results:** A 44 year old female with oral lichen planus developed two synchronous oral cavity squamous cell carcinomas (SCC) treated with exten-

sive resection, reconstruction, and adjuvant chemoradiation. Eighteen months later she developed three new oral cavity SCCs. She underwent resection of the malignancies and reconstruction with right fibula and ALT free flaps. The fibula flap developed congestion on postoperative day one. The venous anastomosis was taken down and thrombus was evacuated. However, there was insufficient length for revision anastomosis. Additionally, there were no other available neck veins with adequate length and caliber given her prior surgical and radiation history. The existing ALT incision was opened, and dissection carried out medially and superficially to the muscular fascia to locate the GSV. A 6 cm segment was harvested and divided into vein grafts for both venae comitantes. Conclusions: It is possible and straightforward to harvest the GSV from an ALT free flap harvest site by extending the dissection medially without the need for an additional incision. The GSV is a valuable option for vein grafting required for a short flap pedicle and/or vessel depleted neck.

10:45 **Transoral Robotic Surgery in HPV+ Oropharyngeal Cancer of Unknown Primary**

Kelsey M. Roman, BS, Irvine, CA; Sina J. Torabi, MD, Irvine, CA; Michael H. Berger, MD, Irvine, CA; Edward C Kuan, MD MBA, Irvine, CA; Tjason Tjoa, MD, Irvine, CA; Yarah M. Haidar, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the impact of transoral robotic surgery on tumor detection and overall survival for HPV+ oropharyngeal head and neck cancer of unknown primary.

Objectives: This study evaluates outcomes associated with transoral robotic surgery (TORS) for HPV+ oropharyngeal head and neck cancer of unknown primary (HNCUP). Study Design: Retrospective cohort. Methods: HPV+ oropharyngeal HNCUPs were isolated from the 2010-2017 National Cancer Database. Overall survival (OS) was assessed, with patients stratified by 1) use of TORS and 2) whether the occult tumor was ultimately located. Predictors of survival were evaluated on univariate and multivariate regression. Results: 3,716 HPV+ oropharyngeal HNCUPs were included. The proportion of cases treated with TORS increased from 6.9% in 2010 to 18.1% in 2017 ($p < 0.001$). Most cases were treated with radiotherapy regardless of surgical treatment (83.3%). However, a lower proportion of TORS patients received radiotherapy than those who received non-robotic surgery and those not treated surgically ($p < 0.001$). Kaplan-Meier analysis demonstrated higher 5 year overall survival (OS) for patients treated with TORS versus without TORS (95.4% +/- 1.7% standard error [SE] versus 84.0% +/- 0.9% SE; $p < 0.001$). Patients with primary tumors identified during treatment had improved OS compared to those whose tumors were not located (5 year OS was 90.5% +/- 0.9% SE and 77.3% +/- 1.5% SE, respectively; $p < 0.001$). For patients in which the primary tumor was found, TORS patients survived longer than non-TORS patients (96.5% +/- 1.4% SE versus 89.1% +/- 1.0% SE 5 year OS; $p < 0.001$). The relationship between TORS and OS remained significant on Cox regression controlling for confounders. Conclusions: Use of TORS in the workup for HPV+ HNCUP is associated with higher rates of occult tumor identification and improved survival.

10:50 **Role of Social Media Support Groups for Patients with Total Laryngectomy**

Madeline Goosmann, MD, Detroit, MI; Vivian Wu, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the utility, pros, and cons of social media based support groups for patients with total laryngectomy. The eventual goal is implementation of information about these groups to patients in the pre and postoperative counseling process.

Objectives: The goal of this study is to identify if social media support groups are useful to participants, and if they should be recommended during preoperative counseling. Study Design: Cross-sectional survey based research. Methods: Participants with laryngectomy on online Facebook support groups with a total of 3600 members were surveyed. The survey consisted of 10 questions: 7 multiple choice and 3 short answer. Results: There were 102 participants, 52% (n=51) of which were male, 4 declined to answer gender. Average age of males was 63.6 (range 44-82) and average age of females was 63.3 (range 31-83). The majority of participants found online support groups very useful, would highly recommend them to others with laryngectomy, checked or liked posts daily, posted themselves daily to weekly, recommend the group to friends/family/medical personnel, and had not met another member in person. Overall, just under half the individuals had gotten either medical supplies or medical advice from others in the group. Common best features of a social media support group mentioned were convenience, readily available and up to date information, immediate response, positivity, acceptance, encouragement, accessibility, empathy, and outlet for frustrations; common worst features mentioned were limited interaction, negativity, inappropriate comments, members dying, poor technology skills, and bad or dangerous advice. Conclusions: Online, social media based support groups are generally very useful to their members. The addition of information about these groups for patients during the pre and postoperative period counseling may be beneficial.

10:55 - 11:00 Q&A

Moderator:

Willard C. Harrill, MD FACS, Hickory, NC

11:00 WITHDRAWN - The Impact of a Financial Advocate on Institutional Financial Toxicity among Head and Neck Cancer Patients

Aaron M. Domack, MD, Cincinnati, OH; Raisa Tikhtman, MD, Cincinnati, OH; Katrina Harrill, MBA BSN RN OCN, Cincinnati, OH; Chad Zender, MD FACS, Cincinnati, OH

11:05 A Survey of Technical Preferences Among Microvascular Surgeons in the AHNS

Keisha Arielle Best, MS, Philadelphia, PA; Ramez Philips, MD, Philadelphia, PA; Aarti Agarwal, MD, Philadelphia, PA; Hamad Sagheer, MD, Philadelphia, PA; Yamil Selman, MD, Philadelphia, PA; Joseph Curry, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify consensus in microvascular practices and to assess differences in practice based on years of practice and free flap volume.

Objectives: 1) To review microvascular practices among surgeons 2) to assess differences based on years of practice and number of microvascular free flaps performed yearly. Study Design: Cross-sectional study. Methods: A national survey addressing practices related to microvascular free flap reconstruction was distributed to AHNS members for completion between October and December 2021. Results: The respondents encompassed 95 microvascular surgeon members. Median years of practice was 6 (interquartile range, 2-13) and median flaps per year was 35 (22-50). Most AHNS members perform arterial anastomosis by cleaning adventitia just enough to place sutures (84.2%), using a double approximating clamp (64.2%), and fixing leaks with additional suture (65%). Though respondents with <6 years of practice were more likely to leave leaks to resolve on their own (50.0% vs 24.5%, $p = 0.010$). AHNS members perceived kinking of the vessel (50.5%) as the riskiest risk factor for flap failure. In cases of tension at venous anastomosis, respondents elected to use the external jugular as the only vein (63.2%), perform end to side anastomosis to internal jugular using suture (63.2%), or use two independent venous systems (45.3%). Most participants elected to perform anastomosis after partial inset (52.6%). In cases of unfavorable pedicle geometry, respondents elected to use dissolvable material to orient pedicle (45.3%). Most respondents give aspirin, but not anticoagulation, immediately postoperatively (66.3%). AHNS members endorse having high threshold for blood transfusion limited to cases of hemodynamic instability (69.5%) and believe that pressors are generally safe to use (72.6%). Conclusions: This survey results suggest relative consensus among AHNS member microvascular surgeons on techniques in free flap surgery but identify variation in approaches.

11:10 **Assessing the Association between Time to Surgery and Survival in Sinonasal Cancer**

Julia Nguyen, BS, Newark, NJ; Rushi Patel, BA, Newark, NJ (Presenter); Soly Baredes, MD, Newark, NJ; Richard Chan Woo Park, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the relationship between time to surgery (TTS) and survival in sinonasal squamous cell carcinoma patients (SSCC).

Objectives: Treatment delays are associated with worse survival in head and neck cancer patients. We assess the association between time to surgery (TTS) and survival in sinonasal squamous cell carcinoma patients (SSCC). Study Design: This is a retrospective database review with multivariate survival analysis using the Cox proportional hazards model. Methods: We queried the 2004-2016 National Cancer Database for all cases of adult SSCC undergoing primary surgical treatment. Patients with missing TTS information were excluded. We conducted a multivariate analysis of patient demographic and clinicopathological characteristics' effect on overall survival (OS) using a Cox proportional hazards model enhanced with cubic spline nonlinear approximation (CHM). Bootstrapping methods were utilized to detect the aggregate risk of TTS delay on patient OS. Results: A total of 2,881 patients met inclusion criteria. The majority of patients were male (63.5%), White (86.3%), and over the age of 60 (58.4%). The CHM detected a nonlinear association between patient OS and TTS below 30 days with a lowest risk occurring on 18 days and steadily increasing subsequently. To analyze the aggregate risk and identify the optimal TTS cut-off after 30 days of surgical delay, the cohort sample was bootstrapped and dichotomized.

The largest increase in aggregated risk was identified at 59 day (HR= 1.006 [0.839 - 1.084], p=0.003). Using 59 days as the optimal TTS cut-off, patients who underwent a delayed surgical treatment (> 59 day after diagnosis) had an increased risk of death by 18.6%. Conclusions: Increasing TTS is associated with worse overall survival in patients with sinonasal cancer. Our study suggests optimal survival outcomes can be achieved with surgery within 59 days after diagnosis.

11:15 Reconstruction of Complex Multi-Subsite Defects Using a Single Anterolateral Thigh Donor Site

Sara Liu, MD, Minneapolis, MN; Ariel Frost, MD, Cleveland, OH; Michael Fritz, MD, Cleveland, OH

Educational Objective: Complex defects involving multiple nonadjacent subsites that would otherwise require two separate free flaps can be reconstructed using three innovative methods, thus allowing the use of a single anterolateral thigh donor site and minimizing patient morbidity.

Objectives: Describe three unique methods of utilizing a single anterolateral thigh (ALT) donor site to reconstruct defects involving multiple nonadjacent subsites. Study Design: Case series. Methods: Retrospective chart review; description of surgical technique. Results: Three strategies were employed to allow for noncontiguous head and neck defect reconstruction with a single donor site 1) harvest of two separate free flaps on divided vascular systems (descending and transverse circumflex artery based flaps) revascularized with separate donor vessels; 2) two flaps based on broadly separated perforators of the descending system with distal pedicle tunneled under or placed over (and subsequently covered) intact tissue; and 3) flow through technique using descending circumflex based free flap with distal continuation of descending pedicle anastomosed to separate (transverse or oblique based) pedicle supplying the second flap. These techniques have been utilized with success in this unique setting. Case examples and diagrams reviewed. Conclusions: Complex defects involving multiple noncontiguous subsites can be reconstructed using a single ALT donor site to minimize patient morbidity while achieving optimal reconstructive goals.

11:20 Understanding Color Match in Microvascular Head and Neck Reconstruction: Comparison of Two Techniques

Neil N. Patel, MD MSC, San Francisco, CA; Arushi Gulati, BS, San Francisco, CA; Erika Stephens, BS, San Francisco, CA; Andrea Park, MD, San Francisco, CA; Rahul Seth, MD, San Francisco, CA; Philip D. Knott, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the importance of optimizing skin color match in complex head and neck reconstruction and describe two techniques to measure skin color match.

Objectives: Head and neck ablative surgery can impose severe disfigurement, particularly when cervicofacial skin is resected. Cutaneous defects are often reconstructed using skin paddles of microvascular free flaps; however, the resulting mismatched skin color represents an aesthetic challenge. While current paradigms of microvascular free flap design focus on tissue durability, shape,

and contour, techniques to optimize and measure color match are lacking. The present study demonstrates two approaches to color match analysis: 1) photometric color averaging, and 2) a novel application of a handheld colorimeter to quantitatively measure the degree of color match achieved. Study Design: Prospective descriptive study. Methods: Patients who underwent microvascular free tissue transfer involving skin were included. Skin color measurements were taken of free flap skin paddles, adjacent native skin, and donor site skin. Color match was assessed during follow by the two aforementioned methods. Quantitative color match was assessed photometrically (Adobe Photoshop) and by colorimetry (NixPro2) using DeltaE2000, the primary outcome measure. Results: Forty-eight patients were included in the study. Linear regression between photometrically derived and colorimetry derived DeltaE200 demonstrated direct association ($R^2 = 0.62$, slope 0.0773). Patients who underwent split thickness skin grafting over myogenous or deepithelialized adipofascial free tissue transfer demonstrated lower DeltaE2000 compared to unaltered skin paddles using both methods (4.2 versus 8.3, $p < 0.01$ by photoanalysis; 3.4 versus 6.6, $p < 0.001$ by colorimetry). Conclusions: In-office colorimetry is an efficient tool to obtain objective color match data. Colorimetry derived color match obviates the challenges posed by lighting, digital processing, and camera quality in photometric analysis.

11:25 - 11:30 Q&A

11:30 - 12:25 PANEL
HPV - Prevention, Nonsurgical and Surgical Management and Next Generation of Surgical Trials for HPV+ OP CA
Moderators:

Devraj Basu, MD PhD FACS, Philadelphia, PA
 Niels C.T. Kokot, MD FACS, Los Angeles, CA

Panelists:

David Goldenberg, MD FACS, Hershey, PA
 Michael L. Hinni, MD FACS, Phoenix, AZ
 Adam J. Luginbuhl, MD, Philadelphia, PA
 Yelizaveta Shnayder, MD FACS, Kansas City, KS
 Baran D. Sumer, MD, Dallas, TX

12:25 - 12:30 Q&A

12:30 - 1:15 LUNCH/VIEW POSTERS - Ocean Ballroom & Courtyard

12:30 - 1:15 NEELY PHYSICIAN/SCIENTIST MEETING - Garden Room

SATURDAY CONCURRENT SESSIONS 10:00 - 12:30
OTOLOGY/NEUROTOLOGY SESSION J - CORONET ROOM

10:00 - 10:55 PANEL
How Can We Help Our Patients Do Better? Future of CI/ABI/Implantable Devices

Moderator:

Charles J. Limb, MD, San Francisco, CA

Panelists:

Marlan R. Hansen, MD, Iowa City, IA
 Judith E.C. Lieu, MD MSPH, St. Louis, MO
 Quyen T. Nguyen, MD PhD, San Diego, CA

10:55 - 11:00 Q&A

Moderator:
Harrison W. Lin, MD, Irvine, CA

11:00 Cerumen Autotransplantation: Single Center Experience of a Novel Technique

Peter M. Debbaneh, MD, Oakland, CA; Priyanka Singh, BS, Newark, NJ; Alexander Rivero, MD, Oakland, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the management of refractory and chronic otitis externa and discuss the utility of cerumen autotransplantation as a potential therapy. Cerumen is a natural biofluid of the body that maintains a homeostatic environment within the external ear via its enzymatic and antimicrobial properties. By utilizing cerumen from a patient's healthy contralateral ear, cerumen can aid in restoring the pathological ear to ideal homeostasis.

Objectives: In this pilot study, the goal is to assess the outcomes of cerumen autotransplantation (CAT) in patients with refractory or chronic OE of bacterial or fungal origin who previously failed standard therapy. Study Design: Case series. Methods: Patients with refractory or chronic OE of bacterial or fungal origin, who previously underwent and failed standard therapy were treated with CAT. Patients with bilateral disease in the past 3 months were excluded. CAT was performed within 1 week after a resolved episode of OE by removing cerumen from the non-diseased ear, dissolving cerumen in mineral oil, and painting on the diseased ear canal. Patients followed up within 1 month. Patient demographics, clinical characteristics, and post-procedure outcomes were collected and analyzed. Results: A total of 5 patients were included in the study, with a mean age of 42.4 and 80% female. Mean number of otitis externa episodes prior to CAT was 4.2 episodes (range: 3-6). Average initial followup time was 3 weeks with one patient following up in 1 year. The most common organism cultured was aspergillus niger. Treatment prior to CAT most commonly included nystatin triamcinolone acetonide ointment and boric acid. After treatment with CAT, 3 out of 5 patients (60%) were disease free at 3 months. No adverse effects were reported. Conclusions: Cerumen autotransplantation has been previously described with no studies evaluating its efficacy to date. This pilot case series provides the first clinical assessment of CAT as a therapeutic option for refractory and/or chronic OE.

11:05 The Impact of Communicating Pre-Visit Expectations on Patient Satisfaction in Otology: A Cluster Randomized Trial Pilot

Olivia A. La Monte, BS, La Jolla, CA; Victor de Cos, BS, San Diego, CA; Eric Du, BS, San Diego, CA; Omid Moshtaghi, MD, San Diego, CA; Peter Dixon, MD, San Diego, CA; Elina Kari, MD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how knowledge of patient expectations prior to an

office visit in a tertiary otology clinic can improve patient satisfaction.

Objectives: Maximizing patient satisfaction after a clinic visit is an essential component of optimizing patient experience from the perspective of providers, health systems, and payers. This study examines whether providing a written summary of patient expectations to otologists enhances post-visit satisfaction and estimates the intervention effect size for sample size planning. **Study Design:** Cluster randomized clinical trial. **Methods:** At a tertiary otology clinic, patients completed a pre-visit questionnaire to elucidate visit expectations. Each clinic day represented a cluster of visits and was randomized to an experimental arm, in which providers were shown the responses to the pre-visit questionnaire, or a standard of care control. Patients were blinded to allocation. Following the visit, both arms completed a post-visit questionnaire derived from short assessment of patient satisfaction and three physician-patient communication scales. **Results:** This study enrolled 21 patients with median age 61 (9 in control arm, 12 in experimental arm). All participants in the experimental arm rated a 10/10 in all satisfaction and communication measures. Participants in the experimental arm were more satisfied with length of time spent with the doctor (mean 9.22 +/- SD 0.46 vs. 10 +/- 0, $p = 0.03$), and more agreeable to statements inquiring if the doctor asked about all their symptoms (9.33 +/- 0.44 vs. 10 +/- 0, $p = 0.047$) and provided them the possibility to ask questions (8.78 +/- 0.52 vs. 10 +/- 0, $p = 0.01$). **Conclusions:** Providing a summary of patient expectations before an otology appointment improved patient satisfaction scores. These data will be used to determine sample size for interventions to improve patient satisfaction in otology.

11:10

Tophaceous Middle Ear Depositions: A Case Series of an Unusual Lesion and Report of Facial Weakness as Presenting Finding

Deepthi S. Akella, MS, San Antonio, TX; Isaac D. Erbele, MD, San Antonio, TX; Huma A. Siddiqui, MD, San Antonio, TX; Alireza Ghezavati, MD, San Antonio, TX

Educational Objective: Tophaceous lesions of the middle ear from gout and calcium pyrophosphate deposition disease (CPPD, previously known as pseudogout) are infrequently reported in the literature. Recognizing its characteristic findings will allow the clinician to accurately narrow the differential diagnosis of bony appearing lesions of the middle ear and improve management.

Objectives: Characterize common and uncommon presentations, radiographic characteristics, and operative findings of tophaceous lesions on the middle ear. **Study Design:** Retrospective review. **Methods:** Consecutive tophaceous lesions of the middle ear presenting to a tertiary care center between January 2021 and December 2021. **Results:** Two cases presented in the study period, neither with a significant rheumatologic history. The first was a 66 year old gentleman with progressive conductive loss, ipsilateral progressive facial weakness over years to a House-Brackmann IV, and an opaque, irregular appearing tympanic membrane anterior to the malleus. On CT, he had a heterogenous, bony appearing lesion centered around the incudomalleolar joint, adjacent to the tympanic segment of the facial nerve. No facial nerve lesion was identified on MRI. A tophaceous lesion of gritty, chalky consistency was encountered intraoperatively and removed, and it was diagnosed as a calcium pyrophosphate deposition (CPPD, pseudogout). His facial nerve improved to a House-Brackmann III immediately postoperatively. The second was a 75 year old gentleman with progressive

conductive loss and a similar tympanic membrane appearance, previously diagnosed with tympanosclerosis. On CT, a similar heterogenous, bony appearing lesion was identified, centered around the cochleariform process. A tophaceous lesion was encountered intraoperatively and removed, diagnosed as gout. Conclusions: Tophaceous lesions of the middle ear are rare, but they have some common findings. Notably, the tympanic membrane can appear opaque and irregular, and the CT demonstrates a radiopaque, heterogenous appearance. Facial weakness is possible but unusual. Specimens of suspected tophi must be sent to pathology fresh for accurate diagnosis.

11:15 **Smartphone Based Cognitive Behavioral Therapy and Customized Sound Therapy for Tinnitus: A Randomized Controlled Trial**

Khodayar Goshtasbi, MS MD, Orange, CA; Mehdi Abouzari, MD PhD, Orange, CA; Pooya Khosravi, BS, Orange, CA; Karen Tawk, MD, Orange, CA; Elaine C. Martin, MD, Orange, CA; Hamid R. Djalilian, MD, Orange, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that a technologic solution which is internet based and remotely available at any time and location can potentially help increase access to care, decrease healthcare costs, and provide a comprehensive and effective management plan for tinnitus.

Objectives: To evaluate the efficacy of a smartphone based application providing tinnitus specific cognitive behavioral therapy (CBT) and customized sound therapy for tinnitus. Study Design: Randomized controlled trial. Methods: This was a prospective randomized controlled trial (RCT). The treatment group participated in daily sound therapy and weekly interactive CBT modules, and the control group did not receive the program (waitlisted). Outcome measures after eight weeks included Tinnitus Functional Index (TFI), Generalized Anxiety Disorder (GAD-7), Patient Health Questionnaire (PHQ-9), Perceived Stress Scale (PSS), and Pittsburgh Sleep Quality Index (PSQI). Results: Ninety-two patients (mean age 57.2 +/- 11.9 years) were included. The treatment (n=47) and control (n=45) cohorts had similar THI, PHQ-9, GAD-7, PSS, and PSQI scores at presentation (all $p > 0.05$). Treatment group patients had significantly higher improvements than controlled patients in their TFI (41.7 +/- 37.4 vs. 4.7 +/- 27.1, $p < 0.001$), PHQ-9 (1.9 +/- 4.2 vs. -0.7 +/- 3.4, $p = 0.002$), GAD-7 (1.1 +/- 3.6 vs. -0.9 +/- 3.3, $p = 0.009$), and PSQI scores (2.5 +/- 3.2 vs. -1.1 +/- 2.1, $p < 0.001$). Treatment group subjects also had significantly higher improvements in seven of the eight TFI domains (all $p < 0.05$). TFI improvements of greater than 20 and 50 points occurred in 36 (76.6%) and 19 (40.4%) of the treatment subjects, respectively. Of the nine treatment group patients presenting with moderate-severe depression, 4 (44.4%) improved to minimal depression. Of the four treatment group patients with moderate-severe anxiety, 2 (50.0%) improved to minimal anxiety. Of the 17 treatment group patients with moderate-severe sleep difficulties, 10 (55.6%) had considerable sleep improvement. Conclusions: This novel smartphone application providing CBT and customized sound therapy was effective in reducing symptom severity and improving anxiety, sleep, and mood for tinnitus patients.

11:20 **Physiologic Effects of Microneedle Mediated Direct Cochlear Injection of Dexamethasone**

Sharon J. Feng, BA BS, New York, NY; Stephen Leong, BA, New York, NY; Aykut Aksit, MS, New York, NY; Elizabeth S. Olson, PhD, New

York, NY; Jeffrey W. Kysar, PhD, New York, NY; Anil K. Lalwani, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss how microneedles can be utilized for inner ear drug delivery.

Objectives: Oral or intratympanic corticosteroids are commonly used to treat sudden sensorineural hearing loss (SSHL), tinnitus, and Meniere's disease. Direct intracochlear delivery has been proposed to overcome the variability in bio-availability and efficacy of systemic or middle ear delivery. In this study, we aim to characterize the consequences of microneedle mediated direct intracochlear injection of dexamethasone through the round window membrane (RWM) on hearing. **Study Design:** In vivo translational. **Methods:** In Hartley guinea pigs (n=5), a postauricular incision followed by bullostomy was made to access the round window membrane (RWM). Using 100 um diameter hollow microneedles mounted on a 30 gauge Hamilton needle, 1.0 ul of 10 mg/mL dexamethasone was injected into the cochlea across the RWM over the course of 1 minute. Compound action potential (CAP) and distortion product otoacoustic action emission (DPOAE) were measured before and 5 hours following injection. **Results:** At 5 hours post-injection, CAP hearing thresholds were not significantly different from the baseline thresholds (p values were greater than 0.05). DPOAEs in all animals were above the noise level; at 5 hours post-perforation, DPOAEs were not significantly different from the baseline values (p values were greater than 0.05). **Conclusions:** Direct intracochlear delivery of dexamethasone via microneedles is safe and does not cause hearing loss, thus providing support for its investigation for the treatment of inner ear disorders.

11:25 - 11:30 Q&A

Moderator:

Rick A. Friedman, MD PhD, Los Angeles, CA

11:30 Detection of Vestibular Schwannoma in Patients Presenting with Sudden Sensorineural Hearing Loss: A Retrospective Chart Review

Pauline P. Huynh, MD, Oakland, CA; Elias S. Saba, MD, Oakland, CA; Jacob E. Hoerter, MD, Oakland, CA; Nancy Jiang, MD, Oakland, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand and review the incidence of vestibular schwannoma (VS) diagnosis in patients evaluated for sudden sensorineural hearing loss (SSNHL). Participants should also understand that steroid therapy may remain useful in improving audiometric outcomes for these patients.

Objectives: 1) To estimate the incidence of VS diagnosis among patients in an integrated healthcare system who present for evaluation of SSNHL; and 2) to evaluate the efficacy of empiric steroid therapy on audiologic recovery among SSNHL patients who were ultimately diagnosed with VS. **Study Design:** Retrospective chart review. **Methods:** A retrospective chart review was performed (2018-2022) of patients presenting with SSNHL at an equal access, integrated healthcare system. Patient demographics, audiometric data, VS diagnosis,

therapeutic steroid intervention, and data regarding treatment response were recorded. A clinically significant audiometric improvement was defined as an increase of at least 15% in word recognition score (WRS), and/or a decrease of at least 15 dB in 5 frequency pure tone average (PTA), using frequencies of 250, 500, 1000, 2000, 4000 Hz. Results: A total of 656 patients were reviewed, of which 452 (53.10% male, median 59 years) met inclusion criteria with audiometric data and MRI data. 12 patients (75% male, median 51 years) undergoing MRI screening for evaluation of SSNHL were found to have vestibular schwannomas. Of these, 7 patients received oral steroid therapy alone, and 5 had combination therapy (oral + intratympanic steroid injections). No patients had intratympanic steroid therapy alone. Median PTA improvement with steroid therapy was 4.36 dB HL and median WRS improvement was 13%. 4 out of 12 patients noted clinically significant audiometric improvement with steroid therapy. Conclusions: To the authors' knowledge, this study represents the largest US based study showcasing the prevalence of vestibular schwannoma diagnosis in patients originally presenting with SSNHL. It also reinforces previous findings that a VS diagnosis does not preclude trial of steroid therapy for audiometric recovery.

11:35 Utility of Targeted PET Imaging to Predict Schwannoma Growth in a Murine Tumor Model

Jake P. Morgan, MD, Birmingham, AL; Sudhir Manickavel, MD, Birmingham, AL; Yolanda E. Hartman, BS, Birmingham, AL; Anna G. Sorace, PhD, Birmingham, AL; Jason M. Warram, PhD, Birmingham, AL; Erika M. Walsh, MD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the ability of targeted PET imaging to predict schwannoma growth behavior and conceptualize its potential future application in the clinical setting regarding the observation of vestibular schwannomas in human subjects.

Objectives: To identify if targeted positron emission tomography (PET) imaging with radiolabeled antibodies can predict tumor growth rate and ultimate tumor size in a murine flank schwannoma model. Study Design: Animal research study. Methods: Rat schwannoma cells were cultured and implanted into 30 athymic nude mice. Once tumors reached 5mm in diameter, the mice were injected with zirconium 89 labeled antibodies (HER2/Neu, VEGFR2, or IgG isotype). PET/CT was performed, and standardized uptake values (SUV) were recorded. Tumors were serially measured until mice were sacrificed per IACUC protocol. Statistical analysis was performed to measure correlations between SUV values, tumor size and growth. Results: Mean tumor sizes in cubic millimeters on day 0 were 144 +/- 162 for anti-HER2/Neu, 212 +/- 247 for anti-VEGFR2, and 172 +/- 204 for IgG isotype groups respectively. Mean growth rates in cubic millimeters per day were 531 +/- 250 for HER2, 584 +/- 188 for VEGFR2, and 416 +/- 163 for the IgG isotype group. For both initial tumor size and growth rates, there was no significant difference between groups. There were significant correlations between maximum tumor volume and both the maximum SUV in the HER2 group ($p = 0.0218$, $R^2 = 0.5020$), and we observed significant correlations between growth rate and maximum SUV ($p = 0.0156$, $R^2 = 0.5394$). Respectively, in the anti-VEGFR2 group, there were no significant correlations. Conclusions: In a murine schwannoma model, immunotargeted PET imaging with anti-HER2/Neu antibodies predicted tumor growth rate and final tumor size.

- 11:40 **Binocular Microscopes Versus Exoscopes: Comparison of User Experience and Performance in Simulated Otologic Surgery****
Luis Pablo Roldan, MD, Miami, FL; Riley Larkin, BS, Miami, FL; Jake A. Langlie, BS, Miami, FL; Juan Chiossone, MD MA FRCS, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to describe user experience and performance using an exoscope compared to the standard operative microscope in simulated otologic surgery.

Objectives: Exoscopes are a potential alternative to traditional binocular microscopes (OM) in microsurgery with proposed advantages of improved ergonomics and smaller device size. Previous studies have validated exoscopes for application in multiple surgical specialties but objective data regarding use of exoscopes in otology is limited. This investigation aims to compare task based efficiency and user experience between OMs and exoscopes using simulated surgical models. Study Design: A prospective crossover study design was used to compare OMs to exoscopes in otolaryngology residents and medical students. Methods: Participants performed five tasks on 3D printed ear models using both the exoscope (Olympus Orbeye) and OM (Zeiss Pentero). Data collection included completion time, frequency of predefined errors, mental effort using Subjective Mental Effort Questionnaires (SMEQ), and user experience using exit surveys. Subgroup analysis was performed based on level of experience. Results: 14 students and 15 residents participated. Completion rates in all tasks were similar between visualization systems. Residents performed three of five tasks faster using the OM ($p = 0.0329$, 0.0014 , and 0.0012) while students showed no difference in performance speed. Number of errors was greater on the exoscope for one task among students ($p = 0.0036$) and no tasks for residents. There was no significant difference in perceived difficulty performing tasks (SMEQ) with either visualization system. Exit survey results showed more favorable opinions of OMs among residents and more favorable opinions of exoscopes among students. Conclusions: The exoscope permits successful performance in simulated otologic tasks. Task performance and user experience between operative microscopes and exoscopes differ based on level of surgical experience.

- 11:45 **Triamcinolone for the Treatment of Cochlear Implant Magnet Displacement****
Karen Tawk, MD, Orange, CA; Khodayar Goshtasbi, MS MD, Orange, CA; Elaine C. Martin, MD, Orange, CA; Mehdi Abouzari, MD PhD, Orange, CA; Hamid R. Djalilian, MD, Orange, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to consider triamcinolone injections as a potential treatment in cochlear implant patients presenting with external magnet adhesion problems.

Objectives: To evaluate the effectiveness of triamcinolone injections in treating external magnet displacement in cochlear implant patients with adhesions problems of their processor. Study Design: A prospective cohort. Methods: This study used data from 8 patients with cochlear implant who underwent triamcinolone 40 mg/mL injections (generally 0.5 mL was injected per side) subcutaneously (not intradermally) at the cochlear implant receiver/magnet site to reduce scalp thickness. Data collected included age, body mass index, hair type, history of trauma or head MRI, device type, type of sound processor, magnet strength,

and preoperative skin thickness. Results: Our cohort consisted of 8 patients of which 7 were overweight or obese. The temporoparietal scalp thickness measured on preoperative CT scans varied between 8.3 mm to 15.9 mm. Initial conservative measures such as hair shaving at the magnet site, using a headband, and increasing magnet strength failed in all patients. After receiving triamcinolone injections at the cochlear implant receiver site, 7 out of 8 patients were able to use their processor again without the need for a headband. The average number of injections required for each patient was 2.25 +/- 2.18 (range = 1-7). One patient required a flap thinning surgery but showed no improvement even after flap thinning. None of the patients showed skin irritation, breakdown, ulceration, necrosis, or magnet exposure during followup period. Conclusions: The significant improvement in cochlear implant retention shows that triamcinolone injections are effective in making the skin thinner and allowing magnet retention.

11:50 Longitudinal Performance of Cochlear Implants in Neurofibromatosis Type 2

Stefanie Seo, BA, Baltimore, MD; Sarek A. Shen, MD MS, Baltimore, MD; Francis X. Creighton, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to identify variables correlated with longitudinal cochlear implant performance.

Objectives: Cochlear implants (CI) are a well established treatment modality for hearing loss due to neurofibromatosis type 2 (NFII). Our aim is to investigate variables that affect longitudinal performance of CIs among patients with NFII. Study Design: Retrospective review at a single academic institution consisting of patients who have received cochlear implants following hearing loss due to NFII. Methods: The primary outcome examined was CI disuse or explantation. Associated clinical and surgical variables were analyzed using descriptive statistics. These included postoperative pure tone average (PTA) at 500, 1000, and 2000 Hz, tumor size, previous surgery, and comorbid depression. Results: A total of 12 patients and 14 cochlear implants were included. The cohort consisted of 8 female and 4 male patients with an average age at implant of 45.8 years (range 34-72 years). 35.7% of CIs (5 out of 14 cases) resulted in disuse or explantation. The average interval until explant was 9.4 years (range 3-14 years). Patients requesting explants were more likely to have a 20-40 dB loss on postoperative PTA compared to those without (100%, 55.6% respectively), as well as an ipsilateral tumor greater than 10mm (100%, 71.4% respectively). In explanted CI cases, 20% had previous surgery and 80% had a diagnosis of comorbid depression as compared to 22.2% and 22.2% respectively in intact CI cases. Conclusions: Despite the recurrent nature of NF2, patients continue to receive audiological benefit from cochlear implants. We found that larger tumor size and comorbid depression may be associated with longitudinal CI failure.

11:55 - 12:00 Q&A

**Moderator:
Wade Wei-De Chien, MD, Baltimore, MD**

12:00 Measurement of Surfing Noise Exposure with the Apple Watch Noise Application

Ethan G. Muhonen, MD, Orange, CA; Mehdi Abouzari, MD PhD, Orange, CA; Fan-Gang Zeng, PhD, Orange, CA; Hamid Djalilian, MD, Orange, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the emerging role of wearable technology in the assessment of sound exposure levels during surfing and other watersports; 2) evaluate the possible need for hearing protection during surfing given the findings presented; and 3) describe future applications of these findings.

Objectives: To quantify sound exposure during participation in surfing utilizing the noise app in the Apple Watch. **Study Design:** Testing was performed by wearing the Apple Watch Series 5 during participation in surfing. Prior to testing the watch was validated against a class 1 sound level meter (Bruel and Kjaer type 2250 G-4). A total of 86 activity sessions were measured, of which 45 provided sufficient noise data for analysis. Noise data was processed within the Apple Health application. Sound exposure time weighted averages (TWA dbA) relative to NIOSH and OSHA exposure standards were calculated for each session. **Methods:** Prior to testing the watch was validated against a class 1 sound level meter (Bruel and Kjaer type 2250 G-4). A total of 86 activity sessions were measured, of which 45 provided sufficient noise data for analysis. Noise data was processed within the Apple Health application. Sound exposure time weighted averages (TWA dbA) relative to NIOSH and OSHA exposure standards were calculated for each session. **Results:** The peak sound exposure measured across all sessions was 120 dB. The average OSHA TWA for all sessions was 87.12 dB, while the average NIOSH TWA was 94.3 dB. All but one session measured peak sounds higher than 112 dB. OSHA daily exposure limits were exceeded by 55.6% of measurable sessions, and NIOSH exposure limits were exceeded in 98% of measurable sessions. **Conclusions:** The Apple Watch noise application allows for sound measurement in ocean environments. During our analysis the Apple Watch noise application measured sound exposure levels exceeding OSHA and NIOSH exposure limits in 56% and 98% of surfing sessions, respectively. These results support that hearing protection should be considered during participation in surfing.

12:05 **Postoperative Complications in Microtia Reconstruction**

Rahul K. Sharma, MD, Nashville, TN; Nicole G. DeSisto, BA, Nashville, TN (Presenter); Kelly Landeen, MD, Nashville, TN; Shiayin F. Yang, MD, Nashville, TN; Scott J. Stephan, MD, Nashville, TN; Priyesh N. Patel, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the differences in outcomes between autogenous and alloplastic implants used in microtia/anotia reconstruction.

Objectives: Microtia/anotia repair requires techniques that consider aesthetics and function. Autogenous and alloplastic implants can be employed as reconstructive frameworks, although the comparative outcomes have not been evaluated on a national scale. The goal of this study is to understand the differences in outcomes between autogenous and alloplastic using a national database. **Study Design:** Retrospective review. **Methods:** This was an analysis of the National Surgical Quality Improvement Program Pediatric database between 2012-2019. Patients with ICD-9/10 codes for microtia/anotia were isolated. Reconstruction

methods were identified using CPT codes for rib graft, ear cartilage graft, and alloplastic implant (e.g., porous polyethylene). Outcomes included operative time, wound complications (wound breakdown/infection), and unplanned reoperations (within 30 days of surgery). Multivariable logistic regression was performed to control for confounders. Results: We included 593 patients for analysis. Rib grafts (N=506,85%) were the most commonly used. 58 patients (9.8%) received a prosthetic implant, and 47 (7.9%) utilized ear cartilage grafts. The wound complication rate was 3.4%. On univariate analysis, prosthetic grafts were associated with a higher risk of wound complications (OR 3.01, 95% CI 0.99-7.59, $p=0.031$) and longer operative times ($b=98.0, 59-137$, $p<0.001$). After controlling for demographics and comorbidities, alloplastic implants conferred an increased risk of wound complications (OR 3.35, 0.98-9.99, $p=0.038$). Conclusions: Alloplastic implants confer an increased risk of early wound complications. As expected, alloplastic implants are associated with longer operative times but with the benefit of a single stage surgery. This is the largest database study to date analyzing these outcomes. Multi-institutional studies should be conducted to validate these findings using patient specific (e.g., microtia grade) and surgeon specific data.

12:10 **Assessing Differences in Academic Productivity between Male and Female Otolaryngology Residents**

Rushi Patel, BA, Newark, NJ; Julia Nguyen, BA, Newark, NJ; Dongmin Kim, BA, Newark, NJ; Mehdi Lemdani, BA, Newark, NJ; Hannaan Choudhry, BA, Newark, NJ; Jean Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to identify differences in research output between residents based on sex and identify potential contributing reasons.

Objectives: To assess research productivity differences between male and female otolaryngology (OTL) residents. Study Design: Cohort study. Methods: We obtained the top 50 OTL departments ranked by reputation by Doximity Residency Navigator. OTL residents from 2021-2022 were identified via program websites and social media. PubMed and Scopus were utilized to identify publications from July 1 of each resident's intern year through December 5, 2021. Research productivity metrics included number of research articles, number of first and second authorships, and number of times publishing in a top 10 otolaryngology journal, as defined by Scopus CiteScore. Results: A total of 977 residents were identified, of which 435 (44.5%) were female. We found no significant difference in gender distribution within top 20 OTL programs (male: 54.2% vs. female: 45.9%, $p=0.435$). The median number of publications for all residents was 2 (IQR: 1-5). Female and male residents had a median number of 2 (IQR: 1-5) and 3 (IQR: 1-6) publications, respectively. Overall, male residents had 20% more publications than female residents ($p=0.0404$). However, there was no significant difference when accounting for congruity between senior author affiliation and resident's residency program ($p=0.114$). Male residents published 33% more with senior authors affiliated with their medical school ($p=0.015$). There was no significant difference in having first or second authorship ($p=0.108$) or publishing in a top 10 OTL journal ($p=0.588$). Conclusions: Our study suggests male residents have higher research output early in their careers. Further study on advancing female involvement in research is warranted.

12:15 **Variability in Minimal Clinically Important Difference (MCID) Calculation and Reporting within the Otolaryngology Literature: A**

Systematic Review

Siddhant H. Tripathi, BS, Cincinnati, OH; Susie Min, BS, Cincinnati, OH; Firas Houssein, BS, Cincinnati, OH; Melissa Previtera, MLIS, Cincinnati, OH; Katie Phillips, MD, Cincinnati, OH; Ahmad Sedaghat, MD PhD, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, participants should have a more nuanced understanding of how MCID is calculated and reported within otolaryngology literature.

Objectives: Best practices for calculation of the minimal clinically important difference (MCID) of outcome measures include the use of complementary methodologies (broadly classified as anchor based and distribution based) and reporting of the MCID's predictive ability. We sought to determine MCID calculation and reporting patterns within the otolaryngology literature. Study Design: Systematic review. Methods: A systematic search strategy of Embase, PubMed, and Web of Science databases was developed and implemented to identify studies reporting determination of an MCID for an outcome measure. Studies specifically within the otolaryngology literature (defined as journals classified as "otorhinolaryngology" in the Journal Citation Reports database) were included. All those journals were additionally searched for relevant articles. Results: There were 35 articles that met inclusion criteria. Of these studies, 88.6% reported MCID of a patient reported outcome measure and the remainder were for objective outcome measurements. Anchor based methods were used by 82.9% of studies and distribution based methods were used by 77.1% of studies. Of all studies, 22.9% utilized anchor based methods alone, 17.1% utilized distribution based methods alone, and 60.0% used both methods. Only 25.7% of studies reported the sensitivity (with mean of 67.6%) and specificity (with mean of 77.8%) of the MCID to detect patients experiencing clinically important change. Conclusions: Deviation from best practices in MCID calculation and reporting exist within the otolaryngology literature, with almost half of all studies only using one method of MCID calculation and almost three quarters not reporting the predictive ability (sensitivity/specificity) of the calculated MCID. When reported, however, MCIDs appear to be more specific than sensitive.

12:20 - 12:30 Q&A

12:30 - 1:15 LUNCH/VIEW POSTERS - Ocean Ballroom & Courtyard

12:30 - 1:15 NEELY PHYSICIAN/SCIENTIST MEETING - Garden Room

**SATURDAY CONCURRENT SESSIONS 1:15 - 3:30
PEDIATRIC OTOLARYNGOLOGY SESSION K - CORONET ROOM**

Moderator:

Valerie A. Flanary, MD FACS, Milwaukee, WI

1:15 Price Variation in Pediatric Otolaryngology Procedures and Studies

Vincent A. Abiona, MPH MS, Chapel Hill, NC; Adam J. Kimple, MD PhD FACS, Chapel Hill, NC; Brent A. Senior, MD FACS, Chapel Hill,

NC

Educational Objective: At the conclusion of this presentation, the participants should be able to quantify the variation in pediatric otolaryngology prices.

Objectives: To assess pricing variability of common pediatric otolaryngology procedures and studies. **Study Design:** Cross-sectional analysis. **Methods:** With the use of hospital price tools, we created a database of hospital reported charges for commonly performed outpatient pediatric otolaryngology procedures at residency affiliated hospitals and conducted a cross-sectional analysis of the results for tonsillectomy and adenoidectomy <12 Yo (CPT 42820), tympanostomy (CPT 69436), tympanoplasty (CPT 69631), sleep study (CPT 95810), and radiographic swallow function study (CPT 92611). **Results:** There was wide variability in reported charges of tonsillectomy, tympanostomy, tympanoplasty, sleep study, and swallow study; \$12,122.1 (range, \$2110-\$21,174), \$4401.65 (range, \$409.6-\$23,854), \$11,997.9 (range, \$365.86-\$58,623), \$3,669.7 (range, \$130-\$15,997), and \$2,278.63 (range, \$240-\$135,847) respectively. While 97% of hospitals had some form of price transparency tool, only 47% of hospitals met CMS guidelines for at least one of the five procedures. Pediatric tonsillectomy, tympanostomy, tympanoplasty, sleep study, and swallow study were in 19%, 30%, 21%, 30%, and 31% of price tools, respectively. **Conclusions:** There is wide variability in reported charges for pediatric tonsillectomy, tympanostomy, tympanoplasty, sleep study, and swallow study. Hospital compliance with the price transparency rule remains low, undermining this effort to reduce health-care costs. Future investigation can determine factors that contribute to hospital prices.

1:20

Tympanoplasty Outcomes in Children with Cleft Palate

Jamie Funamura, MD MPH, Sacramento, CA; Kurtis Young, MD, Sacramento, CA; Mena Said, MD, San Diego, CA; Travis Tollefson, MD MPH, Sacramento, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss patient characteristics associated with reperforation or need for subsequent tympanostomy tube placement in children with cleft palate who have undergone tympanoplasty for chronic perforation.

Objectives: To identify risk factors for reperforation or subsequent tympanostomy tube placement in children with cleft palate undergoing tympanoplasty for chronic perforation. **Study Design:** A retrospective review was conducted of all patients with cleft palate undergoing tympanoplasty at a single institution between January 2003 and December 2021. **Methods:** Patients undergoing tympanoplasty for a reason other than chronic perforation (e.g., retraction, cholesteatoma, middle ear exploration for conductive hearing loss) were excluded. Later need for tympanostomy tube placement or reperforation on followup exam was defined as a tympanoplasty failure. Univariate analysis of patient demographics, palatal cleft type, otologic history, and comorbidities (e.g., velopharyngeal dysfunction [VPD], Pierre Robin sequence [PRS], syndrome) was used to analyze the successful versus unsuccessful tympanoplasty groups. **Results:** There were no significant differences in demographics (sex, race/ethnicity, insurance type, age at tympanoplasty) between patients undergoing successful (N=53) versus unsuccessful (N=11) tympanoplasty procedures. The mean age at time of tympanoplasty was 12.7 (SD 4.0) years. Cleft palate severity by Veau type

and presence of VPD or PRS was not predictive. There were no differences in success rates based on number of sets of tympanostomy tube or sidedness of the perforation. For children with a unilateral cleft palate, the sidedness of the palate did not predict the side of the chronic perforation. A syndromic association or chromosomal deletion (Kabuki, 22q and 2q deletion) was predictive of tympanoplasty failure ($p=0.026$). Conclusions: Severity of palatal clefting, VPD, or micrognathia (PRS), was not associated with differing outcomes in this study of 64 tympanoplasty surgeries at a mean age of 12.7 years. The presence of a syndromic association or chromosomal deletion was predictive of tympanoplasty failure defined as re-perforation or repeat need for tympanostomy tube placement.

1:25 **Establishment and Characterization of Novel Immortalized Middle Ear Cell Lines as Models for Otitis Media**

Simon Blaine-Sauer, BS, Milwaukee, WI; Tina L. Samuels, MS, Milwaukee, WI; Pawjai Khampang, MS, Milwaukee, WI; Nikki Johnston, PhD, Milwaukee, WI; Joseph E. Kerschner, MD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how the novel middle ear cell lines we established and characterized can serve as valuable new models for the field of otitis media research.

Objectives: Otitis media (OM) is the most frequently diagnosed pediatric disease in the US. Despite the significant public health burden of OM and the contribution research in culture models has made to understanding its pathobiology, a single immortalized human middle ear epithelial (MEE) cell line exists (HMEEC-1, adult derived). We previously developed MEE cultures from pediatric patients with non-inflamed MEE (PCI), with recurrent OM (ROM), or with OM with effusion (OME) and demonstrated differences in their baseline inflammatory cytokine expression and response to stimulation with an OM relevant pathogen and cytokines. Herein, we sought to immortalize these cultures and assess retention of their phenotypes. Study Design: Translational. Methods: MEE cultures were immortalized via lentivirus encoding temperature sensitive SV40 T antigen. Immortalized MEE lines and HMEEC-1 grown in monolayer or air liquid interface (ALI) were stimulated with non-typeable haemophilus influenzae (NTHi) lysate. Gene expression [TNFA, IL1B, IL6, IL8, MUC5AC, and MUC5B] was assessed by qPCR. Results: Similar to parental cultures, baseline cytokine expressions were higher in pediatric OM lines than in HMEEC-1 and PCI, and HMEEC-1 cells were less responsive to stimulation than pediatric lines. Grown in ALI, an OME line exhibited greater mucin induction than PCI in accord with the inflammatory status of the tissue of origin. Conclusions: Immortalized MEE lines retained the inflammatory expression and responsiveness of their tissues of origin and differences between non-OM versus OM and pediatric versus adult cultures, supporting their value as novel in vitro culture models for OM.

1:30 **3D Printed Butterfly Cartilage Grafts for Pediatric Tympanoplasty**

Lindsay Boven, MD, Shreveport, LA; Luke White, MD PhD, Shreveport, LA; Pooja Basnet, AuD, Shreveport, LA; Steven Alexander, PhD, Shreveport, LA; Gauri Mankekar, MD, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the advantages and disadvantages of the butterfly

cartilage graft used for pediatric tympanoplasty and learn about 3D printed technology involved in creating biocompatible butterfly cartilage grafts.

Objectives: Eardrum perforations are common in children. An established transcanal repair technique uses butterfly cartilage grafts where tragal cartilage is circumferentially incised with its edges anchoring to the perforation rim. There is a need to develop synthetic grafts when tragal cartilage is not available and to decrease poor cosmetic outcomes with autologous material harvest. **Study Design:** In this feasibility study, we aim to determine the efficacy of novel 3D printed butterfly grafts. **Methods:** Butterfly grafts were 3D printed out of synthetic non-biodegradable elastic polymers. 50 Shore Durometer (50A) and 80 Shore Durometer (80A) polymers were used, with the 80A displaying less compression. 2mm eardrum perforations were created in 6 human cadaver temporal bones. 3D grafts were printed at 3mm in diameter with varying thicknesses (.3mm, .6mm and .9mm). Grafts were additionally created out of human cadaver tragal cartilage (3mm in diameter and .6mm thick). All grafts were inserted into the perforations. Tympanometry was used to assess middle ear volume (ml). **Results:** Control volumes were measured prior to perforation, with an average volume of 1.05ml. The average volumes for tragal, 50A and 80A grafts measured 1.24ml, 1.20ml, and 1.15ml respectively. The 80A grafts showed a significant volume difference compared to the 50A grafts ($p=.01$). The .3mm 80A grafts showed an average volume approaching the control with less than .1ml volume differences; whereas; tragal and 50A grafts showed greater than .1ml volume differences. **Conclusions:** 3D printed butterfly grafts appear to offer effective perforation closure established by tympanometry, with the .3mm 80A grafts showing the most effective closure.

1:35

Associations between Social Vulnerability Indicators and Pediatric Tonsillectomy Outcomes

Chad Alexander Nieri, BSCHm, Memphis, TN; Camron Miles Davies, MD, Memphis, TN; Jordan Beale Luttrell, MD, Memphis, TN; Anthony M. Sheyn, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the generation of a social vulnerability index (SVI) and its implications; 2) demonstrate the impact SVI has on complications and readmissions; and 3) determine the significance SVI has on the management of patients in pediatric otolaryngology.

Objectives: To investigate the impact of neighborhood level social vulnerability on pediatric tonsillectomy outcomes. **Study Design:** Single center retrospective cohort study. **Methods:** Children aged 2 to 17 years that underwent tonsillectomy from August 2019 - August 2020 were included. Addresses were geocoded with geographic information systems, and spatial overlays were used to assign census tract level social vulnerability index (SVI) scores to each patient. Univariate logistic regression models were used to identify associations between SVI and complications or readmissions. **Results:** The study included 400 patients with a mean age of 6.6 (+/- 3.8), 51.2% were male, 142 had comorbidities (35.5%), 52 experienced complications (13%), and 33 experienced readmission (8.3%). A higher overall SVI score (odds ratio [OR], 5.5; 95% CI, 1.5-19.503) was significantly associated with an increased rate of readmission and complication. A subgroup analysis of patients without comorbidities revealed an even greater effect between SVI and readmission or complication (OR, 10.6, 95% CI

1.4-82.8). There was no significant difference in complication and readmission regarding gender, race, age, health insurance, or history of prematurity. Conclusions: Children residing in areas of greater social vulnerability were more likely to experience a complication or readmission, with no significant difference in their race, gender, age, health insurance status, or prematurity. Additionally, SVI's effect was even greater after removing comorbid children. These results suggest that neighborhood conditions influence patient outcomes after undergoing tonsillectomy. This elevated risk has potential implications for preoperative decision making, clinic followups, and treatment plans for patients residing in disenfranchised neighborhoods.

1:40 Cellular Distribution of Estrogen Receptor and Progesterone Receptor in Idiopathic Subglottic Stenosis

Edward Ryan Roxas Talatala, BS, Nashville, TN; Marisol Ramirez-Solano, MS, Nashville, TN; Quanhu Sheng, PhD, Nashville, TN; Alexander Hillel, MD, Baltimore, MD; Alexander Gelbard, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the localization of hormone receptors within airway scars from idiopathic subglottic stenosis patients.

Objectives: Idiopathic subglottic stenosis (iSGS) is an unexplained progressive fibrosis of the upper airway. iSGS almost exclusively affects women; as a result, female hormones (estrogen and progesterone) have been proposed to participate in the pathogenesis of iSGS. Our aim was to localize cell specific gene expression of estrogen receptor (ESR1 & ESR2) and progesterone receptor (PGR) using an established iSGS single cell RNAseq cell atlas. Study Design: Airway scar and healthy mucosa from iSGS patients were sequenced and the expression of ESR1, ESR2, and PGR were quantified and localized to cell types. Methods: An established single cell RNAseq atlas consisting of 25,974 individually sequenced cells from subglottic scar or matched unaffected mucosa in iSGS patients was interrogated for RNA expression of ESR1, ESR2, and PGR. Results were quantified and compared across cell types, then visualized using Uniform Manifold Approximation and Projection (UMAP). Confirmatory protein assessment of endocrine receptors was preformed via flow cytometry. Results: The proximal airway mucosa in iSGS patients demonstrates differential expression of endocrine receptors (ESR1, ESR2, PGR). Within airway scar, endocrine receptors are primarily expressed by fibroblasts, immune cells, and endothelial cells. Fibroblasts show strong ESR1 and PGR expression, while immune cells possess RNA for both ESR1 and ESR2. Endothelial cells predominantly express ESR2. Epithelial cells in unaffected mucosa express all 3 receptors, which are all dramatically reduced in airway scar. Conclusions: Single cell RNA sequencing data localized endocrine receptor expression to specific cell subsets. These results provide the foundation for future work interrogating how hormone dependent mechanism promote, sustain, or participate in iSGS disease pathogenesis.

1:45 - 1:50

Q&A

Moderator:

Soham Roy, MD FACS, Aurora, CO

1:50

Early Utilization of Ketorolac in Cleft Palate Repair

Alexandra Michalowski, MD, New York, NY; Vikash Modi, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the relationship between utilizing ketorolac and improved hospital outcomes after primary palatoplasty.

Objectives: Adequate pain control after palatoplasty is crucial for patient post-operative recovery and nutritional tolerance. Previous studies have identified the safety of single dose of ketorolac, but there is minimal literature examining whether this provides significant postoperative pain control. The goal of this study is to examine the impact of ketorolac usage in the first 24 hours postoperatively in patients undergoing palatoplasty for cleft palate repair. **Study Design:** Retrospective chart review. **Methods:** Patients who underwent palatoplasty with pediatric otolaryngologists at a tertiary medical center between 2010-2020 were identified. Data including demographics, length of stay, analgesic dosage, and whether ketorolac was initiated within 24 hours of palatoplasty were collected. T test analysis was performed to determine if there was a significant difference in hospital LOS or opioid requirement between subjects who did and did not receive ketorolac 24 hours post-palatoplasty. **Results:** 56 subjects (46.4% female) were included. Mean age at time of surgery was 12.9 (range 9.9-30.3) months. Subjects who received ketorolac within the first 24 hours post-palatoplasty had significantly shorter LOS (mean 1.68 vs 2.57 days, $p=0.01$) and lower opioid requirement (mean of 2.84 vs 8.38 morphine milligram equivalents, $p=0.001$) during hospitalization compared to subjects who did not receive ketorolac. **Conclusions:** Patients who received ketorolac had decreased LOS and decreased opiate requirement. This has important consequences to help improve pain control with reduced opiates requirement as well as length of stay. Future studies should investigate whether ketorolac usage affects long term recovery and post-discharge opiate requirements.

1:55

Assessing the Impact of Socioeconomic Status on the Presence of Severe OSA in Children

Jenny Kim, BA, Dallas, TX; Yann-Kou Kou, MD, Dallas, TX; Stephen R. Chorney, MD MPH, Dallas, TX; Ron B. Mitchell, MD, Dallas, TX; Romaine F. Johnson, MD MPH, Dallas, TX

Educational Objective: At the end of the presentation the learner will understand the relationship between socioeconomic status and the presence of severe OSA in children.

Objectives: This study examines the relationship between social advantage and severe obstructive sleep apnea (OSA) in children. **Study Design:** Retrospective case series. **Methods:** A retrospective case control study was performed on children referred for full night polysomnography for OSA. Patients were divided into more or less social advantage using a validated measure, the Area Deprivation Index (ADI). The primary outcomes were the relationship between the AHI and the presence of severe OSA, and secondary outcomes were residual OSA after tonsillectomy. **Results:** N=251 children were included. 177 (71%) were socially disadvantaged (ADI greater than 51). The mean (SD) age was 9.9 (3.4), 130 (52%) were male, and the majority were White (N=153, 61%), with 63% (N=157) of Hispanic ethnicity. N=140 (56%) were obese. The mean (SD) AHI was 17 (25).

There was no difference in the mean AHI between more and less disadvantaged groups (18.0 vs. 17.2, $P=.82$) or the presence of severe OSA (54% vs. 46%, $P=.52$). There was also no difference in residual OSA (74% vs. 25%, $P=.26$). Severe OSA was associated with obesity (OR=2.9, 95% CI = 1.69 - 5.22), and residual OSA was associated with older age (OR=1.2, 95% CI = 1.05 - 1.37). Conclusions: The ADI was not associated with severe OSA or residual OSA in this cohort of children. Although more social disadvantage may increase the risk of comorbidities associated with OSA, it was not an independent risk factor in this study.

2:00

Survival after Declining Pediatric Tracheostomy Placement

Palmila Liu, MD, Dallas, TX; Rebecca L. Brooks, MSN APRN RNIC PCNS-BC, Dallas, TX; Ashley F. Brown, MS CCC-SLP BCS-S, Dallas, TX; Yann-Fuu Kou, MD, Dallas, TX; Romaine F. Johnson, MD MPH, Dallas, TX; Stephen R. Chorney, MD MPH, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize that decisions pertaining to tracheostomy placement are challenging for caregivers of critically ill children. Providing outcomes when children did not obtain a tracheostomy helps counsel families and assist providers in these difficult discussions.

Objectives: To determine survival among critically ill children when caregivers decline tracheostomy placement. Study Design: Retrospective cohort. Methods: All children (<18 years) obtaining a pre-tracheostomy consultation but without caregiver consent to placement at a tertiary children's hospital between 2016 and 2021 were included. Outpatient consultations, consultations performed as options for airway surgery, and children obtaining a tracheostomy at a subsequent consultation were excluded. Comorbidities and outcomes were recorded including status at latest followup. Results: Fifty-eight children that met inclusion. Mean age at consultation was 5.8 years (SD: 6.1), 53% were male and mean gestational age was 35.7 weeks (SD: 5.4). Common comorbidities included sepsis (74%), chronic lung disease (66%), congenital cardiac disease (55%), and syndromes (40%). After caregivers declined tracheostomy, 31% (N=18) died during the hospitalization within a mean of 1.2 months (SD: 1.4) after consultation. There were 21% of children (N=12) that initially survived but died at a mean of 23.6 months (SD: 17.5) (range: 2.2-55.2 months) after discharge. At latest followup, 52% of all children (N=30) were deceased within a mean of 10.7 months (SD: 16) from consultation. Among children who died, age at consult was similar (4.4 years (SD: 5.6) vs. 7.3 years (SD: 6.4), $P=.08$). However, on univariate analysis history of sepsis (61% vs 27%, $P=.04$) and intubation at consult (69% vs. 31%, $P=.008$) were associated with mortality. Conclusions: When caregivers declined tracheostomy placement, less than half of critically ill children in this cohort survived and 31% died prior to hospital discharge. This information offers valuable insight for families weighing decisions pertaining to pediatric tracheostomy placement.

2:05

Barriers to Decannulation in Trisomy 21 Patients Undergoing Laryngotracheal Reconstruction

Daniel Blumenthal, MD, Washington, DC; James Leonard, MD, Washington, DC; Hengameh Behdzapour, MSHS, Washington, DC; Andy Habib, BS, Washington, DC; Diego Preciado, MD PhD FACS FAAP, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to identify potential barriers to decannulation in Down syndrome (DS) patients undergoing laryngotracheal reconstruction (LTR).

Objectives: To identify potential barriers to decannulation in Down syndrome (DS) patients undergoing laryngotracheal reconstruction (LTR). Study Design: Case series and chart review. Methods: We performed a retrospective chart review from 1996 to 2021 of 193 children who underwent LTR for treatment for laryngotracheal stenosis at a stand alone tertiary children's hospital. Demographic, medical, preoperative, surgical, and postoperative outcomes were obtained from chart review. Time to decannulation analysis was performed using Kaplan Meier analysis and evaluated with log rank and Cox proportional hazards regression. Study outcomes were the ability to decannulate and the time to decannulation. Results: We determined that DS patients carry an inherit risk for decannulation failure compared to the general population (OR: 6.112, $P = .044$, 1.046-35.730). Of the 8 patients with DS only three were decannulated. Overall, patients with Trisomy 21 had a significantly increased time to decannulation when compared to all LTR patients ($P = .008$, log rank). We found that these patients are more likely to have both preoperative suprastomal collapse ($P = .0004$, Fischer's Exact) and postoperative tracheomalacia ($P = .034$, Fischer's Exact) compared to all other LTR patients. While postoperative tracheomalacia did not significantly affect decannulation failure ($P = .056$, Fischer's Exact) it did significantly prolong decannulation in all LTR patients ($P = .018$, log rank). Conclusions: Trisomy 21 patients are at an increased risk for decannulation failure. Our study illustrates that these poor outcomes are likely a result of conditions more commonly found in this cohort including: narrow tracheal caliber, tracheomalacia and hypotonia.

2:10 Pediatric Head and Neck BB Gun Injuries: A National Electronic Injury Surveillance System Analysis

Thomas L. Haupt, BS, Washington, DC; Andrew Wadley, BS, Washington, DC; Earl H. Harley, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to know the incidence, baseline characteristics, and risk factors of BB gun injuries treated in US emergency departments among children under 18 years old.

Objectives: To investigate head and neck BB gun injuries treated in US emergency departments among children under 18 years old. Study Design: Cross-sectional database analysis. Methods: We examined the National Electronic Injury Surveillance System data for head and neck BB gun injuries from 1993 through 2019. Sex, age, incidence, injury location, hospital type, and disposition were analyzed. Logistic regression was used to obtain the odd ratios of hospitalization based on these parameters. Results: We identified 4011 cases of pediatric BB gun related head and neck injuries treated in US emergency departments. Children's (32.5%) and very large hospitals (28.7%) were the most common type of emergency departments visited for these injuries. Most patients were male (84%), and the most common age group affected was 10-14 years old (49.7%). The face (35.8%), eye (27.4%), and head (18.39%) were the most common sites of injury. 7.5% of patients were hospitalized, and eye (47.1%) and neck (26.5%) injuries accounted for most hospitalizations. Compared to other age groups, ages 0-4 had increased odds of hospitalization after eye injury (OR 2.48, 95%

CI 1.15-5.32, $p < 0.05$) despite a lower incidence of injury in this age group. Conclusions: BB gun related head and neck injuries remain a source of emergency room visits within the US. Increased education concerning firearm handling and the use of protective eyewear is paramount. Extra precaution around younger children is critical, as the injury severity tends to be more significant in this age group.

2:15 Endotracheal Tube Pressures Exerted on the Laryngotracheal Complex and Novel Support Device to Reduce It

Andrew M. Vahabzadeh-Hagh, MD, San Diego, CA; Shiv H. Patel, BSE, San Francisco, CA; Brennan P. Marsh-Armstrong, BSE, San Diego, CA; Luke Lindenmuth, BSE, San Diego, CA; Zeyu Feng, BSE, San Diego, CA; Ken Loh, PhD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe laryngotracheal complications resulting from endotracheal tube intubation. They should also have an understanding of the quantitative pressures of endotracheal tubes of varying sizes and configurations on the laryngotracheal complex.

Objectives: Here we quantify the pressures of endotracheal tubes of various sizes and configurations on the laryngotracheal complex to gain an understanding of the potential damaging forces between endotracheal tubes and the cartilaginous larynx. Here we also provide pilot testing of a novel support device to offload these forces. Study Design: Pilot study with human cadavers. Methods: Endotracheal intubation was performed on human cadavers using various endotracheal tube sizes. The tubes were affixed with a force sensing resistor (FSR). The pressures exerted on the larynx were measured for each of the commonly used endotracheal tubes. A novel support device (endotracheal tube clip) was attached to the endotracheal tubes and changes in pressure were observed. Results: Pressures on the posterior larynx increase with increasing tube size. This can be mitigated with a novel endotracheal tube clip. Conclusions: Here we demonstrate the first quantitative measurement of pressures that endotracheal tubes exert on the larynx. We demonstrate a novel device that can easily clip onto an endotracheal tube creating an anterior bend in the tube that results in reduction of pressures on the laryngotracheal complex. This preclinical test paves the way for a human clinical trial now enrolling.

2:20 - 2:25 Q&A

**2:25 - 3:20 PANEL
CHARGE Syndrome: E&M of Ear, Swallowing, Airway Issues and Establishing a Multidisciplinary Center
Moderator:**

Daniel I. Choo, MD FACS, Cincinnati, OH

Panelists:

Craig A. Buchman, MD FACS, St. Louis, MO

Shelagh A. Cofer, MD, Rochester, MN

Alessandro de Alarcon, MD MPH, Cincinnati, OH

3:20 - 3:25 Q&A

3:25 - 3:35 **INVITED PRESENTATION**
Update on Subspecialty Board Certifications
Brian Nussenbaum, MD FACS, Houston, TX
Kathleen C.Y. Sie, MD FACS, Seattle, WA

3:35 - 3:40 **Q&A**

3:45 - 4:00 **COFFEE BREAK**

SATURDAY CONCURRENT SESSIONS 1:15 - 3:30
GENERAL & HEAD & NECK SESSION L - CROWN ROOM

1:15 - 2:10 **PANEL**
Controversies in Thyroid/Parathyroid Disease
Moderator:
Amy Y. Chen, MD FACS, Atlanta, GA
Panelists:
Allen S. Ho, MD, Los Angeles, CA
Ashok R. Shaha, MD FACS, New York, NY
Michael C. Singer, MD FACS, Detroit, MI
David L. Steward, MD FACS, Cincinnati, OH

2:10 - 2:15 **Q&A**

Moderator:
Liana Puscas, MD MHS MA FACS, Durham, NC

2:15 **Association between Modified Frailty Index and Postoperative Outcomes of Tracheostomies**
Sree Chinta, BS, Newark, NJ; Dhiraj Raju Sibala, BS, Newark, NJ; Keshav Dilip Kumar, MPH, Newark, NJ; Navya Pendyala, BA, Newark, NJ; Michael S. Hegazin, DO, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the viability of the modified frailty index in determining an association with postoperative outcomes of tracheostomy.

Objectives: The modified frailty index (mFI-5) has been used to stratify patients into categories based on risk of postoperative complications in several surgical procedures. This study investigates the association between mFI-5 score and tracheostomy complications. Study Design: Retrospective database review. Methods: The National Surgical Quality Improvement Program (NSQIP) database was queried for patients who underwent tracheostomies between 2005 and 2018. The mFI-5 was calculated for each patient by assigning one point for each of the following comorbidities: DM, hypertension, CHF, COPD, and dependent health status. Univariate and multivariable analyses were conducted to determine associations between mFI-5 score and postoperative complications. Results: 4,469 patients undergoing tracheostomies were queried, and they were stratified into the following groups: mFI=0 (n=1,753 [39.2%], mFI=1 (n=1,728

[38.7%]), mFI=2 (n=409 [9.2%]), mFI of 3 or higher (n=3254 [5.7%]). Univariate analysis showed that patients with higher mFI-5 scores had a greater proportion of smoking, dyspnea, obesity, steroid use, emergency cases, any complication, reoperations, and mortality (p less than 0.001). Multivariable analyses found associations between mFI-5 score and any complication (OR=1.408, CI: 1.150-1.724, p=0.001), mortality (OR=2.309, CI: 1.108-4.812, p=0.026), and any medical complication (OR=2.748, CI: 1.848-4.086, p less than 0.001). Conclusions: This study suggests an association between mFI-5 score and postoperative complications in tracheostomies. mFI-5 score could be evaluated prior to tracheostomy and can be used to stratify tracheostomy patients by operative risk.

2:20 **Rates of Long Term Audiologic followup among Cisplatin Treated Head and Neck Cancer Patients Enrolled in Ototoxicity Monitoring Program**

David S. Lee, MD, St. Louis, MO; Emma Y. Travis, BS, St. Louis, MO; Susan K. Wong, BA, St. Louis, MO; Cathryn Collopy, AuD, St. Louis, MO; Angela L. Mazul, PhD MPH, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the trends in audiologic followup and hearing aid utilization among head and neck cancer patients treated with cisplatin.

Objectives: To determine rates of long term ototoxicity monitoring among head and neck cancer patients treated with cisplatin. Study Design: Single center retrospective cohort study. Methods: Adults with head and neck cancer treated with cisplatin from January 1, 2014, through September 7, 2021 were identified from a tertiary care center ototoxicity monitoring program. Patients with prior ototoxic chemotherapy use (i.e., carboplatin) were excluded. The primary outcome was rate of post-treatment audiograms within 6 months, at 12 months, and after 12 months. Secondary outcomes included prevalence of new or worsening patient reported otologic symptoms (hearing loss, tinnitus, and/or dizziness) and hearing aid use at last followup. Results: Two hundred ninety-nine head and neck cancer patients treated with cisplatin were analyzed. The rate of post-treatment audiograms within 6 months, at 12 months, and after 12 months were 72%, 7%, and 11%, respectively. The rate of patients without any post-treatment audiogram was 26%. Hearing loss (35%) and hearing loss associated with tinnitus (28%) were the most prevalent patient reported ototoxicities. Among those recommended hearing aids (54%, n=160/299), the rate of utilization was 24% (n=39/160). Conclusions: Cisplatin treated head and neck cancer patients enrolled in an ototoxicity monitoring program demonstrate moderately high rates of follow up for post-treatment audiograms. However, long term followup tapers dramatically after 6 months and overall hearing aid utilization is low. Further research is needed to understand factors associated with loss of long term audiologic followup and barriers to hearing aid utilization to inform interventions that decrease untreated hearing loss in cancer survivorship.

2:25 **Impact of the Affordable Care Act on Racial Disparities in Outcomes of Well Differentiated Thyroid Carcinoma: A National Cancer Database Study**

Margaret Nurimba, MD, Los Angeles, CA; Megha K. Sheth, BA, Los Angeles, CA (Presenter); Mark Swanson, MD, Los Angeles, CA; Tamara Chambers, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to assess the impact of the Affordable Care Act (ACA) of 2010 and race on disease presentation and overall survival for patients with well differentiated thyroid carcinoma.

Objectives: To assess the impact of the Affordable Care Act (ACA) of 2010 and race on disease presentation and overall survival for patients with well differentiated thyroid carcinoma. **Study Design:** Cross-sectional study of patients who underwent partial or total thyroidectomy with or without postoperative radioactive iodine (RAI) for well differentiated thyroid carcinoma between 2004-2018 in the National Cancer Database (NCDB). **Methods:** Overall survival (OS) was assessed with Cox proportional hazard regression analyses. **Results:** There were significant disparities in disease presentation at time of diagnosis, with Black, API, and Hispanic patients more likely to have metastatic disease (p less than 0.001) and higher TNM stage (p less than 0.001) at time of diagnosis compared to White patients. Black patients had significantly increased risk of death (HR 1.280, 95% CI 1.168 - 1.403) but API patients had improved OS (HR 0.717, 95% CI 0.621 - 0.827) compared to White patients. Patients who lived in states that expanded Medicaid after the passage of the ACA had significantly lower risk of death (HR 0.799, 95% CI 0.742 - 0.860, p less than 0.001) compared to those diagnosed and treated prior to the ACA, with White (HR 0.775, 95% CI 0.711 - 0.845, p less than 0.001) and Black patients (HR 0.772, 95% CI 0.595 - 1.001, p = 0.051) demonstrating trends toward improvement in survival outcomes after passage of the ACA. **Conclusions:** Racial disparities significantly impact thyroid carcinoma diagnosis and treatment in the US. Preliminary data suggests that expansion of health care access may improve thyroid cancer outcomes, however analysis of the ACA's long term impact and ability to address health inequities is still warranted.

2:30 Trends in Electronic Cigarette Use Among Head and Neck Cancer Patients in the U.S.

Neelima Panth, MD MPH, New Haven, CT; Amar Sheth, BA, New Haven, CT; Vickie Wang, BA, New Haven, CT; Hisham Abdou, BA, New Haven, CT; Michael Lerner, MD, New Haven, CT; Benjamin Judson, MD, New Haven, CT

Educational Objective: At the conclusion of the presentation, participants should be able to 1) describe epidemiologic trends in electronic cigarette use in the head and neck cancer population; and 2) summarize existing literature examining the relationship between electronic cigarettes and risk of head and neck cancer.

Objectives: Conventional cigarette use is associated with increased risk of head and neck cancer (HNC), as well as increased morbidity and mortality in HNC patients undergoing treatment. Early studies indicate that e-cigarettes may also be associated with risk of HNC pathogenesis and reduced treatment efficacy. As e-cigarette use appears to be rising among cancer patients, understanding patterns of use in this high risk population is increasingly important. We aim to characterize epidemiologic trends in electronic cigarette use among patients with HNC in the US. **Study Design:** Cross-sectional. **Methods:** The National Health Interview Survey, an annual cross-sectional survey, collects data on a range of health topics across US adults. We queried the database from 2014-

2018 to collect harmonized demographic data on participants reporting a head and neck cancer diagnosis and e-cigarette use. Regression analysis was conducted to assess for associations and account for confounding. Results: Among 255 participants reporting a HNC diagnosis, 35 (13.7%) reported having used e-cigarettes. HNC patients below age 50 were more likely (AOR 18.77; 95% CI, 6.71-52.51) to use electronic cigarettes compared to those above age 50. Smokers of conventional cigarettes were more likely (AOR 7.46; 95% CI, 2.24-24.90) to use electronic cigarettes compared to nonsmoking HNC patients. Compared to HNC patients in the Northeast, those in the South were more likely (AOR 4.87; 96% CI, 1.51-15.72) to use electronic cigarettes. Level of education was not associated with electronic cigarette use in HNC patients. Conclusions: Electronic cigarette use in HNC patients is significantly associated with younger age, conventional smoking status, and geographic region. Otolaryngologists should be aware of trends in electronic cigarette use among HNC patients and consider incorporating targeted screening and counseling into their practice when appropriate.

2:35 **Appraisal of Clinical Practice Guidelines for the Treatment and Management of Anaplastic Thyroid Carcinoma**

Jonathan Philip Kuriakose, MS, New Brunswick, NJ; Neeraj Suresh, BS, Philadelphia, PA; Najm Khan, MBS, New Brunswick, NJ; Emma De Ravin, BS, Philadelphia, PA; Karthik Rajasekaran, MD FACS, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the need for standardization among practice guidelines and a greater emphasis placed on the applicability of guidelines' recommendations.

Objectives: To identify and appraise various guidelines for anaplastic thyroid carcinoma (ATC) treatment and management. **Study Design:** Retrospective guideline appraisal. **Methods:** A comprehensive literature search was performed in MEDLINE (via PubMed), EMBASE, SCOPUS, and Google Scholar databases from their respective inception to May 1, 2022. Each guideline was independently evaluated by four reviewers utilizing the Appraisal of Guidelines for Research and Evaluation (AGREE II) instrument. For each subcategory, domain scores were formulated with a satisfactory threshold of greater than 60%. To evaluate agreement between reviewers, intraclass correlation coefficients (ICCs) were calculated. Results: 284 articles were identified from the literature search. 12 articles were evaluated after the removal of duplicates and application of inclusion and exclusion criteria. Of these, two were "high" quality, three were "average" quality, and seven were "low" quality. The domains with the highest mean scores were "clarity and presentation" (69.44 +/- 16.75) and "scope and purpose" (68.87 +/- 20.88), while "applicability" (7.12 +/- 6.17) and "rigor of development" (50.26 +/- 20.77) had the lowest mean scores. There was a high level of agreement between reviewers with ICC statistical analysis of the 6 domains ranging from 0.689-0.924 (good to excellent), with all but one domain being greater than 0.75 (excellent). **Conclusions:** Our results showcased the wide variability in quality amongst guidelines for treatment and management of ATC. Additionally, the majority of reviewed guidelines fell short of the quality and methodologic rigor set forth by the AGREE II instrument. These findings indicate a great need for the standardization of practice guidelines and a larger focus placed on the applicability of guidelines' recommended practices.

2:40 - 2:45

Q&A

Moderator:**Miriam Lango, MD FACS, Houston TX****2:45****Improvement in Outcomes of Advanced and Metastatic Head and Neck Squamous Cell Carcinoma after Immune Checkpoint Inhibitor Approval: A Nationwide Analysis**

Neel R. Sangal, MD, Philadelphia, PA; Elizabeth Sell, BA, Philadelphia, PA; Robert Brody, MD, Philadelphia, PA; Jason Brant, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand changes in outcomes of advanced HN-SCCa after immune checkpoint inhibitors were approved.

Objectives: Immune checkpoint inhibitors (ICI) were granted FDA approval in 2016 for patients with advanced squamous cell cancer of the head and neck (ASCCaHN). There has been no previous nationwide evaluation of the impact of the approval of ICI on the outcomes in ASCCaHN. Study Design: This study is designed to analyze the survival outcomes of ASCCaHN patients before and after approval of ICIs in 2016. Patients with ASCCaHN were selected from the Surveillance, Epidemiology, and End Results (SEER) database. Methods: Patients were selected for advanced or metastatic oropharyngeal, oral cavity, laryngeal or hypopharyngeal carcinoma from 2014-2019 as defined by AJCC 8th edition staging guidelines. Subjects were stratified to pre-ICI and post-ICI groups. Intercohort chi squared frequency analysis, Kaplan-Meier survival and multivariate Cox regression models were used to assess the impact of ICI. Results: A total of 14,050 cases of ASCCaHN met inclusion criteria, and were stratified into pre-ICI (n=6810, 48.5%) and post-ICI (7240, 51.5%). On univariate analysis those diagnosed with ASCCaHN post-ICI had a significantly higher 2 year disease specific survival (DSS) (63.5% vs 62.2%, $p < .001$) than pre-ICI. On multivariate Cox regression, controlling for all demographic, clinicopathologic, and treatment characteristics, cases diagnosed post-ICI continued to exhibit a significant hazard benefit (HR 0.91, 95% CI: 0.85 - 0.97). These analyses were repeated with years immediately pre- and post-ICI with persistent improvement in survival. Conclusions: DSS and OS of ASCCaHN increased significantly following FDA post-ICI. Further studies are warranted to directly assess survival benefit and toxicity profile.

2:50**The Value of Adherence to National Comprehensive Cancer Network Post-Treatment Followup Guidelines in Patients with Head and Neck Squamous Cell Carcinoma**

Ashley Stone, BA, Bronx, NY; Jianyou Liu, MS, Bronx, NY; Bradley A. Schiff, MD, Bronx, NY; Thomas J. Ow, MD MS, Bronx, NY; Vikas Mehta, MD MPH, Bronx, NY; Richard V. Smith, MD, Bronx, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify factors associated with adherence to National Comprehensive Cancer Network post-treatment surveillance guidelines among patients diagnosed with head and neck squamous cell carcinoma between 2001-2020.

Participants should also be able to assess the survival benefit of adherence to followup guidelines.

Objectives: The utility of intensive post-treatment surveillance of head and neck squamous cell carcinoma (HNSCC) has been debated in the literature. The objective is to investigate adherence to the National Comprehensive Cancer Network (NCCN) post-treatment followup guidelines and assess the association with recurrence and survival. **Study Design:** Retrospective cohort study. **Methods:** 452 patients diagnosed with HNSCC at an academic medical center in a socioeconomically disadvantaged, urban setting were categorized by adherence to NCCN followup guidelines. Survival analyses were conducted in the entire cohort, and subset of patients with documented recurrence, by constructing Kaplan-Meier survival curves compared by log rank tests and creating multivariate Cox proportional hazards models. **Results:** 23.5% of patients were adherent to NCCN followup guidelines in the first year post-treatment, and 15.9% were adherent over five years. Adherence in the first year was associated with longer five year overall survival (HR 0.634; 95% CI 0.443-0.906; $p=0.0124$) and disease specific survival (HR 0.556; 95% CI 0.312-0.992; $p=0.0470$), but consistent adherence over five years did not show a significant association. Among the 21.7% of the cohort with recurrence, adherence was not associated with early stage recurrence (AJCC stage I / II). In this subset, first year adherence was associated with improved disease specific but not overall survival, and adherence over five years did not predict survival. **Conclusions:** Adherence to NCCN followup guidelines in the first year post-treatment was associated with longer five year disease specific and overall survival, but this significant association was not observed among those who demonstrated consistent adherence over five years.

2:55

Words Matter: Are We Using the Right Ones? A Systematic Review of Readability of Patient Education Materials and Health Literacy in Head and Neck Cancer

Maria Armache, MD, Philadelphia, PA; Richard Wu, MPH, Philadelphia, PA; Amy E. Leader, MD, Philadelphia, PA; Kristin Rising, MD MSHP, Philadelphia, PA; Joshua Mease, BS; Philadelphia, PA; Leila J. Mady, MD PhD MPH, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to have a comprehensive understanding of the current state of the readability of online patient education materials in head and neck cancer.

Objectives: Patient education materials (PEMs) can promote patient engagement, satisfaction, and treatment adherence. Patients with low health literacy who may not be able to understand or act upon this information are at risk for negative health outcomes. We aimed to assess the readability of head and neck cancer (HNC) PEMs and health literacy in this population. **Study Design:** Systematic review. **Methods:** Peer reviewed studies between 1995-2022 were searched using the terms “head and neck cancer”, “health literacy”, “readability”, and their synonyms. Full text, English studies with quantitative readability outcomes [Flesch-Kincaid Grade Level (FKGL) (0-18; higher grades correlate with higher difficulty; Flesch Reading Ease (FRE) (1-100; higher scores indicate easier readability), among others] and/or health literacy measures [Single-item Brief Health Literacy Screen (SILS), among others] were included. **Results:** Among 2421 studies identified, 15 were included. These studies evaluated 1197 web based PEMs from professional society, hospital, health, and government related

sources. The weighted average of FKGL across studies was 11.28 (SD=1.01) while mean FRE was 47.27 (SD=5.6). The average FKGL among professional society PEMs was 10.64 (SD=0.79). No studies reported FKGL greater or equal to 6, while 64.3% had average FKGL greater than 10. Health literacy, assessed by SILS, was inadequate in 36.4% of patients. Conclusions: Over one-third of HNC patients demonstrate inadequate health literacy, yet no available PEMs assessed through the included studies were written at or below the NIH recommended 6th grade level. This highlights the need to address the readability of materials created and disseminated to minimize the detrimental effects of incongruence between patient understanding and health information

3:00 Utilization of Dynamic Risk Stratification in Patients with Tall Cell Variant Papillary Thyroid Cancer

David I. Zimmer, MD DVM, Cleveland, OH; Gilman D. Plitt, MD, Cleveland, OH; Emily Zhang, MD, Cleveland, OH; Hong Li, BA, Cleveland, OH; Joseph Scharpf, MD, Cleveland, OH

Educational Objective: To introduce or familiarize individuals with an aggressive variant of papillary thyroid carcinoma as well as the dynamic risk stratification tool. We also seek to show physicians that they can use of the dynamic risk stratification tool as a strong predictor of outcomes, even in a high risk variant of papillary thyroid carcinoma.

Objectives: Tall cell variant of papillary thyroid cancer (TCV) is subtype of papillary thyroid cancer (PTC) associated with aggressive tumor behavior, advanced stage, and higher rates of recurrence and mortality. The present study aimed to test an established dynamic risk stratification tool in the TCV population, with the goal of better predicting the postoperative course of these patients. Study Design: Retrospective chart review. Methods: A total of 94 patients with TCV who underwent a total thyroidectomy (TT) with radioactive iodine ablation (RAI) were retrospectively reviewed from 1998 through 2020. Biochemical, structural, and overall response to treatment was determined for each patient, based on postoperative thyroglobulin levels and imaging findings. Primary outcomes were locoregional and distant recurrence, presence of disease at final followup, need for additional intervention, and disease specific mortality. Results: Patients with TCV who were stratified as having an excellent overall response to treatment had lower rates of locoregional recurrence at 5 years than indeterminate, biochemical incomplete and structural incomplete responses (2.0%, 33.3%, 55.0% and 85.7% respectively) [$p < 0.001$]. The same was also true for distant recurrence (2.0%, 9.0%, 35.1%, and 42.9%) [$p < 0.001$]. Excellent response was also predictive of lower rates of presence of disease at final followup, need for additional intervention, and disease specific mortality. Conclusions: Although TCV is an aggressive subtype and associated with worse clinical outcomes than classical PTC, patients with an excellent overall response to treatment have significantly improved outcomes when compared to indeterminate, biochemical incomplete and structural incomplete responses.

3:05 The Impact of Race on Overall Survival among Veterans with Head and Neck Cancer Treated Surgically

Amanda R. Walsh, MD, Washington, DC; Veranca Shah, BS, Washington, DC; Thomas Haupt, BS, Washington, DC; Jessica Maxwell, MD MPH, Washington, DC

Educational Objective: To understand the impact of race and other clinical demographic factors on overall survival among veterans with head and neck cancer.

Objectives: There is limited data on the impact of clinical demographic factors and outcomes among veterans with head and neck squamous cell carcinoma (HNSCC). This study was undertaken to evaluate factors affecting overall survival (OS) in a population of veterans with HNSCC treated with curative intent. Study Design: Retrospective cohort study. Methods: Data was collected on veterans with HNSCC who were treated with curative intent via surgery +/- adjuvant chemoradiation at our institution between 1999-2021. Variables collected included clinical demographic data, treatment type, recurrence and cause of death. Time to treatment initiation (TTI; defined as time from histopathological diagnosis to date of surgery) and total package time (TPT; defined as time from surgery to completion of adjuvant treatment) were determined. Individual parameters were evaluated for association with OS. Results: Among 134 veterans, the vast majority were male (98.5%) and 55.2% were black. Black veterans had significantly lower 3 year OS ($p=0.0246$) compared to white veterans. Three year OS was also significantly worse for veterans with hypopharynx primaries (50%, hazard ratio [HR]=2.68, 95% CI=1.03-6.94), followed by 65.7% for larynx, 66.7% for oral cavity primaries, and 72.2% for oropharynx ($p=0.0163$). Other factors associated with worse OS included lower body mass index (BMI) ($p=0.0012$), need for a prophylactic trach ($p=0.0002$) or feeding tube ($p=0.0013$), and advanced stage at presentation (HR=3.10, 95% CI=1.38-6.97). Among all patients, the median TTI was 31.9 days while the median TPT was 104 days. Conclusions: In veterans with HNSCC treated surgically, black race and lower BMI may be indicative of worse OS following treatment.

3:10 - 3:15

Q&A

Moderator:**Steven J. Wang, MD, Tucson AZ**

3:15

Temperature Profile Measurement from RF Nasal Airway Reshaping Device

Eric Abello, MD, Orange, CA; Theodore V. Nguyen, BS, Orange, CA (Presenter); Benjamin F. Bitner, MD, Orange, CA; Katelyn K. Dilley, BS, Orange, CA; Pranav Nair, Orange, CA; Justin S. Kim, Orange, CA; Brian J.F. Wong, MD PhD, Orange, CA

Educational Objective: At the conclusion of this presentation, the participants should better understand the temperature profile of the RFA nasal airway reshaping device on nasal cartilage.

Objectives: Nasal airway obstruction (NAO) is caused by various disorders including nasal valve collapse (NVC). A bipolar RFA stylus (Vivaer, Aerin Medical, Sunnyvale, CA) has been used to treat NAO in the outpatient. This technology focuses on using RF energy to generate heat in the upper lateral cartilage (ULC), leading to improvement in patient symptoms. The purpose of this study is to measure temperature elevations in nasal tissue using infrared (IR) radiometry to map the spatial and temporal evolution of temperature. Study Design: Experimental. Methods: Porcine nasal cartilage was harvested and sectioned into 1 mm and 2 mm thick slices, to mimic ULC structure. The device was used

per treatment protocol to heat the cartilage through porcine mucosa. An IR camera (FLIR ExaminIR software, Teledyne, Wilsonville, OR) was used to image temperature on the back surface of the specimen. Results: IR temperature recordings showed an average pretreatment temperature of 19.76°C in 1mm, and 20.805°C in 2mm thick cartilage. The maximum back surface temperature reached during treatment was 47.74°C in 1mm cartilage and 50.23°C in 2mm thick cartilage. Temperature maps were generated showing both the temporal and spatial evolution of temperature. The results were compared to the estimates generated by a finite element model developed to model the heating process. Arrhenius integrals were numerically evaluated to estimate cartilage damage. Conclusions: Preliminary studies performed on porcine nasal mucosa and cartilage show a maximum temperature of 50.23°C, a time temperature threshold that may result in thermal damage to cartilage.

3:20

Vocal Cord Dysfunction -- Evaluation and Management of the Patient Presenting with Dyspnea of Unclear Etiology

Claire Gleadhill, MD, Tucson, AZ; Natalie Monahan, MS CCC-SLP, Tucson, AZ; Helena T. Yip, MD, Tucson, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the presentation of patients with vocal cord dysfunction and the options for treatment.

Objectives: Vocal cord dysfunction (VCD) or dyspnea of unclear etiology, a common reason for otolaryngology referral, remains an ill defined and difficult to treat entity. This study sought to characterize VCD disorders, including laryngoscopy findings and response to treatment. Study Design: Case series of 93 patients referred to tertiary laryngology practice with concern for VCD. Methods: Medical records of patients referred for VCD or dyspnea of unclear etiology to a tertiary laryngology practice from 2018-2022 were reviewed. Patients with posterior glottic and subglottic/tracheal stenosis were excluded from the study. Patients were evaluated with exercises to provoke dyspnea. Laryngoscopy was considered abnormal if adduction was observed for more than 50% of the inhalation phase. Results: Reported symptoms in the intermittent dyspnea (n=88, 95%) patients varied from throat tightness, laryngospasm and dyspnea on exertion. Constant dyspnea was reported in five patients (5%). Eleven patients had history of COVID-19 including 5 who required intubation but without tracheostomy. Laryngoscopy at rest was abnormal (paradoxical vocal fold motion) in 27% (n=25). 4% (n=4) of patients exhibited inappropriate adduction on inhalation post-exercise. Topical anesthesia (4% lidocaine) reversed the adduction in 1%(n=1). Of 70% (n=65) receiving speech therapy, 41% (n=27) improved symptomatically. Gabapentin helped two patients (2%) whose primary complaints were throat tightness. Botox injection was performed in 5 patients (5%) with severe symptoms and two (2%) had improved symptoms. Conclusions: Vocal cord dysfunction is a heterogenous disorder with varying degrees of vocal fold adduction at rest and post-exercise. Patients with VCD may have normal laryngoscopy findings, possibly because of the intermittent nature of this disorder. Effective treatment may include speech therapy, topical anesthesia, gabapentin and Botox injection.

3:25

Complications and Swallowing Outcomes after Esophageal Reconstruction with an Intact Larynx

Aarti Agarwal, MD, Philadelphia, PA; Michelle Fiorella, BS,

Philadelphia, PA; Ramez Philips, MD, Philadelphia, PA; Eric Barbarite, MD, Philadelphia, PA; Howard Krein, MD, Philadelphia, PA; Ryan Heffelfinger, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the etiologies of esophageal perforation requiring reconstruction, reconstructive techniques, and associated outcome measures.

Objectives: Esophageal perforation carries significant morbidity while also posing a reconstructive challenge. Here, we examine our experience with esophageal reconstruction and outcomes of surgical intervention. **Study Design:** Retrospective chart review. **Methods:** Retrospective review of patients who underwent esophageal reconstruction between 2009-2021 at a tertiary academic institution. Patient demographics, surgical techniques, need for enteral access, surgical outcomes and complication rates were examined. **Results:** Nine patients were included. Esophageal reconstruction was performed for extruded spinal hardware (n=5), esophageal stricture (n=2), esophageal fistula (n=1) and esophageal diverticulum (n=1). Five patients underwent reconstruction with free tissue transfer, and four with local pedicled flaps. Preoperatively, four patients (44%) were tube feed dependent. At three months postoperation, 4/5 patients who were not tube feed dependent prior to surgery returned to oral intake, while one required two additional esophageal dilations before returning to oral intake 18 months postoperatively. Of the patients who were tube feed dependent preoperatively, one was tolerating oral intake by nine months postoperatively, one patient remained tube feed dependent secondary to neurologic injury, one was lost to followup, and one passed away. There were no cases of flap failure, esophageal fistula, or wound dehiscence. One patient had postoperative bleeding requiring return to operating room. Three patients had postoperative wound infection, two of whom required washout. There were no unplanned 30 day readmissions. **Conclusions:** Repair of esophageal perforation is a reconstructive challenge. In this study, we found that surgical intervention with free tissue transfer and local pedicled flaps is effective in returning patients to oral intake with low long term morbidity.

3:30

Pembrolizumab Associated Chronic Rhinosinusitis: A New Endotype and Management Considerations

Neil N. Patel, MD MSc, San Francisco, CA; Taylor Standiford, MD, San Francisco, CA; Grant Gochman, MS, San Francisco, CA; Amritpal Singh, BA, San Francisco, CA; Andrew N. Goldberg, MD MSE, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the manifestation of chronic rhinosinusitis (CRS) in patients treated with pembrolizumab therapy, PD-1 inhibitor immunotherapy.

Objectives: Pembrolizumab is an immunotherapy with expanding oncologic treatment indications. Along with its increasing use, there is expanding awareness of immune related adverse effects. To date, no study has reported on the sinonasal effects of pembrolizumab. Here, we investigate the association of pembrolizumab exposure to sinus inflammation. This study first examines radiographic changes in the paranasal sinuses, and secondarily proposes management strategies to CRS in patients under active pembrolizumab treatment. **Study Design:** Retrospective observational study. **Methods:** Retrospective chart review was

performed of patients initiating PD-1 inhibitor, pembrolizumab for cutaneous or mucosal melanoma between 2016 and 2019, excluding sinonasal mucosal melanoma. PET-CT scans were used to obtain Lund-Mackay (LM) scores. Three timepoints were analyzed from each patient: pre-treatment with pembrolizumab, 3-6 months after treatment onset, and 6-12 months after treatment onset. Non-parametric paired t tests were used to compare mean LM scores. Results: Of the 217 patients reviewed, 113 met inclusion criteria. Mean pre-treatment LM score was 1.01 (standard deviation 0.97), and LM scores demonstrated statistically significant increases at both 3-6 months (1.78, $p=0.001$) and 6-12 months (1.69, $p=0.001$) after treatment initiation. Fifteen patients were diagnosed with chronic rhinosinusitis. Among this newly diagnosed CRS cohort, LM scores increased after initiation of pembrolizumab (2.46 at baseline versus 4.67 at 3-6 months and 3.46 at 6-12 months, $p = 0.004$). Conclusions: Patients receiving PD-1 inhibitor, pembrolizumab, may experience an increase in sinonasal mucosal inflammation. A subset of these patients may develop new drug induced rhinosinusitis, which represents a new clinical entity warranting awareness and a nuanced management approach.

3:35 **The Current State of Regionalization in Otolaryngologic Tumor Care**

Sina John Torabi, MD, Orange, CA; Khodayar Goshtasbi, MD, Orange, CA; Tjason Tjoa, MD, Orange, CA; Yarah M. Haidar, MD, Orange, CA; Hamid R. Djalilian, MD, Orange, CA; Edward C. Kuan, MD MBA, Orange, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand patterns of regionalization of care within the realm of head and neck cancers and should be able to understand factors that influence whether a patient is treated at a high volume facility.

Objectives: Although recent literature suggests a positive relationship between hospital case volume and improved surgical outcomes, the extent that regionalization of otolaryngologic cancer care has occurred is unclear. This study characterizes case volume regionalization patterns for four distinct otolaryngologic tumors -- head and neck squamous cell carcinomas (HNSCCs), thyroid cancers (TCs), vestibular schwannomas (VSs), and pituitary adenomas (PAs). **Study Design:** Retrospective database study. **Methods:** The 2010-2016 National Cancer Database (NCDB) was queried for adult patients with HNSCC, TC, VS, and PA. Facility geographic locations were divided into northeast, south, midwest, and west. High volume facilities (HVF) were defined as top 100 by volume facility for ≥ 1 pathology. **Results:** There were 1342 treating facilities, of which 191 (4.2%) were defined as an HVF. VS care was the most regionalized, with 65.9% of patients treated at an HVF and traveling the farthest (median=27 miles). TC (37.4%) and HNSCC (38.8%) patients were least commonly treated at HVFs. Of the 191 total HVFs, 41 (21.5%) were classified as HVFs for all four pathologies, while 84 (44.0%) were HVFs for only one. Academic institutions (62.3% of all HVFs) were distributed differently by pathology (66.3% VS vs. 73.0-79.0% other pathologies). HVFs were largely located in the south (39.8%). Factors predictive of treatment receipt at HVFs included age <65 , higher income, and private insurance (for all four pathologies), larger tumor size (for VS and PA), and lower TNM stage (for TC). **Conclusions:** Over 20% of HVFs were considered high volume for all four pathologies, with VS being the most regionalized. Many factors influence whether a patient is treated at a HVF.

3:40 - 3:45 Q&A

3:45 - 4:00 COFFEE BREAK

SATURDAY GENERAL SESSION 4:00 - 4:40 - CROWN ROOM

4:00 - 4:40 PANEL
Communicating in the New World: Social Media - The Good, The Bad and The Ugly

Moderator:

Michael M. Johns III, MD, Los Angeles, CA

Panelists:

Hayley L. Born, MD MS, New York, NY

Sujana S. Chandrasekhar, MD FACS, New York, NY

Nina L. Shapiro, MD FACS, Los Angeles, CA

4:40 - 5:30 SPEED NETWORKING - ASK US ANYTHING
CORONET ROOM

In this speed networking session, you'll have the opportunity to meet and network with some of the most prominent and experienced society and departmental leaders. The roundtable setting will provide a comfortable and casual backdrop to foster valuable dialogue between you, your peers and leaders in Otolaryngology. Questions will be solicited in advance so you will have the chance to hear different perspectives on those burning issues that keep you up at night.

Carol R. Bradford, MD FACS, Columbus, OH

Sujana S. Chandrasekhar, MD FACS, New York, NY

Amy Y. Chen, MD FACS, Atlanta, GA

Rick A. Friedman, MD PhD, Los Angeles, CA

M. Boyd Gillespie, MD MSc FACS, Memphis, TN

Marlan R. Hansen, MD, Iowa City, IA

Michael M. Johns III, MD, Los Angeles, CA

Andrew H. Murr, MD FACS, San Francisco, CA

Shawn D. Newlands, MD PhD MBA FACS, Rochester, NY

Myles L. Pensak, MD FACS, Cincinnati, OH

Harold C. Pillsbury, MD FACS, Chapel Hill, NC

Samuel H. Selesnick, MD FACS New York, NY

Maria V. Suurna, MD FACS, Miami, FL

Dana M. Thompson, MD FACS, Chicago, IL

P. Ashley Wackym, MD FACS, New Brunswick, NJ

Peter A. Weisskopf, MD FACS, Phoenix, AZ

J. Paul Willging, MD FACS, Cincinnati, OH

Kathleen L. Yaremchuk, MD MSA, Detroit, MI

5:30 ADJOURN

5:30 - 6:30

**MEET THE AUTHORS POSTER RECEPTION - Ocean
Ballroom**

6:30

BEACH BASH - Boardwalk & Beach

POSTER PROGRAM

Allergy/Rhinology

1. **A Real World Study of Prevalence and Medical Responsiveness of Eustachian Tube Dysfunction in Chronic Rhinosinusitis**

Sarah M. Adams, BS, Cincinnati, OH; Armo Derbarsegian, BS, Cincinnati, OH; Ahmad R. Sedaghat, MD PhD, Cincinnati, OH; Katie M. Phillips, MD, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the burden of eustachian tube dysfunction in chronic rhinosinusitis; 2) describe the efficacy of standard medical management for chronic rhinosinusitis on improving symptoms of eustachian tube dysfunction; 3) describe predictors of success in treatment eustachian tube dysfunction with medical management of chronic rhinosinusitis; and 4) use this information to counsel patients in their practice and inform the overall treatment of chronic rhinosinusitis.

Objectives: To determine the prevalence and medical responsiveness of eustachian tube dysfunction (ETD) in chronic rhinosinusitis (CRS) in a real world setting. Study Design: Prospective longitudinal. Methods: A total of 175 adult patients with CRS presenting for initial treatment were recruited. All participants completed a 22 item Sinonasal Outcome Test (SNOT-22) and the 7 item ETD questionnaire (ETDQ-7). Results: At presentation, participants had a mean SNOT-22 score of 49.3, mean ETDQ-7 score of 21.3, with 65.7% having ETD (defined by ETDQ-7 greater than 14.5). After at least 4 weeks of treatment with intranasal corticosteroids and saline irrigations, the SNOT-22 score dropped by a mean 11.6 points, ETDQ-7 score dropped by a mean 3.1 points and 51.4% of participants still met criteria for ETD. Amongst participants who started with ETD, the ETDQ-7 score dropped by a mean 5.1 points. The change in ETDQ-7 score was associated with the initial ETDQ-7 score ($b=-0.34$, 95% CI: -0.45 to -0.22 , $p<0.001$)--indicating greater improvement in ETDQ-7 score associated with worse initial symptoms--but no other clinical or disease characteristics. Amongst participants starting with ETD, however, higher ETDQ-7 score was associated with lower likelihood of not having ETD after treatment (OR=0.86, 95% CI: 0.79 - 0.93, $p<0.001$). Having ETDQ-7 score greater than 21 before treatment was predictive (sensitivity: 68.8%, specificity: 83.1%) of having ETD after treatment as well. Conclusions: ETD is a common and difficult to treat comorbidity in CRS. In a real world setting, standard approaches to appropriate medical management may be limited in their ability to improve, or resolve, ETD.

2. **Is Geriatric Malnutrition an Important Consideration in Skull Base Surgery?**

Owais M. Aftab, BS, Newark, NJ; Aman M. Patel, BS, Newark, NJ; Mehdi S. Lemdani, BA, Newark, NJ; Hannaan S. Choudhry, BA, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of the geriatric nutritional risk index and its association with complications following skull base surgery.

Objectives: To analyze the association between the geriatric nutritional risk index (GNRI) and adverse outcomes in patients undergoing skull base surgery. Study

Design: Retrospective database review. Methods: This retrospective cohort analysis utilized the 2005-2018 National Surgery Quality Improvement Program database. CPT codes were used to identify skull base surgeries (61546, 61548, 61580-61581, 61600, 6160, 61605-61608, 61618-61619, 62165). Demographics, comorbidities, and complications were compared between well nourished patients, GNRI greater than 73, and severely malnourished patients, GNRI less than 73, using unadjusted chi square analysis. The independent effect of malnourishment was evaluated through multivariable logistic regression. Results: 223 (71.25%) well nourished and 90 (28.75%) poorly nourished skull base cases were identified from 2005 to 2018. Chi square analysis indicated malnourished patients had higher rates of diabetes (20.2% vs. 7.4%; $p=0.003$), smoking (21.1% vs. 9.1%; $p=0.008$), and weight loss (8.9% vs. 1.3%; $p=0.003$). No significantly varying demographics were found. Unadjusted chi square analysis indicated that malnourished patients had higher incidences of sepsis (5.6% vs. 1.3%; $p=0.047$), pneumonia (10.0% vs. 1.8%; $p=0.002$), death (11.1% vs. 0.4%; $p<0.001$), extended length of stay (28.9% vs. 7.6%; $p<0.001$), and extended operation time (18.9% vs. 9.0%; $p=0.020$). After adjustment for confounders, multivariable logistic regression demonstrated that GNRI was an independent risk factor for an extended length of stay (OR 4.500; 95% CI 1.821 - 11.117, $p=0.001$), death (OR 9.616; 95% CI 1.003 - 92.219; $p=0.050$), and pneumonia (OR 6.042; 95% CI 1.349 - 27.068; $p=0.019$). Conclusions: GNRI is an important factor associated with increased risk of morbidity, mortality, and increased extended length of stay in patients undergoing skull base surgery.

3. **WITHDRAWN - Airway Involvement and Intervention in Non-Angiotensin Converting Enzyme Inhibitor Induced Angioedema**
 Michel S. Castle, MD, Rochester, NY; Bartholomew J. Bacak, MD PhD, Rochester, NY; Chantal K. Barbot, DO, Dayton, OH; Luxman Srikantha, DO, Centerville, OH; Noah A. Stern, DO, Detroit, MI; Nathan D. Vandjelovic, DO, Rochester, NY
4. **Chronic Invasive Fungal Rhinosinusitis and Granulomatous Invasive Fungal Sinusitis: A Systematic Review of Symptomatology and Outcomes**
 Rohini R. Bahethi, MD, Newark, NJ; Guy Talmor, MD, Newark, NJ (NOT PRESENTER); Chris Tseng, BA, Newark, NJ; Rushi Patel, BA, Newark, NJ; Hannaan Choudhry, BA, Newark, NJ; Wayne Hsueh, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the key differences in the presentation and outcomes of chronic invasive fungal rhinosinusitis and granulomatous invasive fungal rhinosinusitis.

Objectives: To characterize chronic invasive fungal rhinosinusitis (CIFRS) and granulomatous invasive fungal rhinosinusitis (GIFRS). Study Design: Systematic review. Methods: A comprehensive search strategy was designed to identify studies in the Cochrane, EMBASE and PubMed Databases. Inclusion criteria included all patients with a diagnosis of CIFRS or GIFRS. All studies were screened by two independent reviewers. Chi square analyses were used where appropriate. Results: 2 studies were included totaling 509 patients. The majority were diagnosed with CIFRS (385, 75.6%) compared to GIFRS (124, 24.4%). CIFRS was more common in immunocompromised or diabetic patients (p less than 0.0001,

$p=0.02144$). Patients with CIFRS were more likely to exhibit nasal symptoms including discharge ($p=0.00014$), obstruction ($p=0.033$) and congestion ($p=0.0009$) as well as systemic symptoms including fever, which no GIFRS patient exhibited, facial pain ($p=0.0065$), headache ($p=0.0035$). Aspergillus was the most common organism identified in both groups with a slight predominance among GIFRS patients ($p=0.013$). GIFRS patients were also more likely to present with no identifiable organisms ($p=0.00059$). CIFRS patients were more likely to die of disease ($p=0.00075$). Conclusions: CIFRS generally presents with more symptoms and is associated with poorer outcomes primarily occurring in an immunocompromised population. GIFRS likely follows a more insidious course in immunocompetent patients. Understanding the key differences in symptomatology and outcomes for these two populations is critical for appropriate diagnosis and prognostication.

5. **Effects of Delayed Surgical Intervention for Treatment of Chronic Rhinosinusitis on Sinonasal Airway Anatomy and Function**

Amanda M. Balash, BS, Boca Raton, FL; Dennis O. Frank-Ito, PhD, Durham, NC

Educational Objective: Participants should be able to understand changes in sinonasal function from medical management versus surgical intervention - a case study of a patient with a 6 year delay before surgical intervention.

Objectives: To investigate changes in sinonasal anatomy and function from delayed surgical intervention for treatment of chronic rhinosinusitis in an adult male patient who waited 6 years before undergoing functional endoscopic sinus surgery (FESS). Study Design: Computational modeling study. Methods: Computed tomography scans of the patient were obtained at 3 time points; initial diagnosis (PRE1), 31 months after initial diagnosis (PRE2), and 46 months after PRE2 (POST; 6 months after FESS). Patient had bilateral disease and was under medical management from PRE1 to PRE2. Sinonasal airways were constructed from the CT scans and volume was quantified. Airflow simulations were performed at 15L/min in PRE1, PRE2, and POST; resistance values were calculated and compared with normative data (mean +/- standard deviation) from 12 healthy male subjects. Results: FESS decreased bilateral resistance (Pa.s/mL) to normative levels: PRE1=0.458, PRE2=0.230, POST=0.024, and normal=0.036 +/- 0.020. PRE1-PRE2 reduction was 50% and 95% from PRE1-POST. On the less diseased left side, PRE1-PRE2 nasal airway volume increased by 32%, and PRE1-POST by 59%. The maxillary sinus volume shrunk by 16% from PRE1-PRE2 and increased by 8% from PRE1-POST. From PRE1-PRE2, frontal (9%) and ethmoid (77%) volumes increased but the sphenoid (14%) volume shrunk. From PRE1-POST, frontal (48%), ethmoid (715%), and sphenoid (14%) volumes all increased. On the more diseased right side, except the frontal (20%) volume that increased from PRE1-PRE2, volume of the other regions shrunk (nasal=4%, maxillary=7%, ethmoid=33%, sphenoid=20%). However, from PRE1-POST, the volume of every region increased (nasal=36%, maxillary=59%, frontal=67%, ethmoid=296%, sphenoid=13%). Conclusions: FESS was effective in improving patient's outcomes compared to medical management.

6. **Using the Sino-Nasal Outcome Test (SNOT-22) to Study Outcome of Treatment of Nasal Obstruction**

John W. Behnke, MD, Morgantown, WV; Caroline Dundervill, BS, Morgantown, WV; Mustafa Bulbul, MD, Morgantown, WV; Mark Armeni, MD, Morgantown, WV; Hassan Ramadan, MD MSc, Morgantown, WV;

Chadi Makary, MD, Morgantown, WV

Educational Objective: At the conclusion of this presentation, the participants should be able to articulate the use of the Sino-Nasal Outcome Test as an outcome measure for treatment of nasal obstruction secondary to nasal septal deviation and/or inferior turbinate reduction.

Objectives: To validate the Sino-Nasal Outcome Test (SNOT-22) as an outcome measure for nasal obstruction and to determine if it correlates with the Nasal Obstruction and Septoplasty Effectiveness (NOSE) scale. **Study Design:** Retrospective cohort study. **Methods:** All patients presenting to our otolaryngology clinic for nasal obstruction secondary to nasal septal deviation and/or inferior turbinate hypertrophy between August 2020 and June 2022 were asked to fill both the SNOT-22 and the NOSE questionnaires. Demographics and comorbidities were reviewed. Patients with chronic rhinosinusitis (CRS) were excluded. SNOT-22 total and subdomain scores were then compared to NOSE scores. **Results:** 126 patients completed both surveys. Average age was 42.3 years (range 13.5-78.1 years), and 40.5% were female. 34 patients had septoplasty and inferior turbino-plasty (IT), 33 had functional septorhinoplasty and IT, 5 patients had IT, and 54 patients had medical treatment. Overall, SNOT-22 and NOSE scores correlated well preoperatively and postoperatively ($r=0.54$, $p<0.0001$; $r=0.68$, $p<0.0001$ respectively). The rhinologic and sleep SNOT-22 subdomains scores had the strongest correlation to NOSE score ($r=0.56$, $p<0.0001$; $r=0.64$, $p<0.0001$ respectively). Both NOSE and SNOT-22 scores showed improvement postoperatively [NOSE: 67.4 vs 25.1 ($p<0.0001$) at 3 months, 69.5 vs 34 ($p<0.0001$) at 6 months; SNOT-22: 37.1 vs 25.2 ($p=.002$) at 3 months, 38.1 vs 22.6 ($p=0.002$) at 6 months]. No significant improvement in NOSE or SNOT scores was seen in the medical treatment group. **Conclusions:** SNOT-22 instrument can be used to study the outcome of treatment for nasal obstruction secondary to nasal septal deviation and/or inferior turbinate reduction.

7. **A Rare Case of Invasive and Necrotizing Pseudomonas Sinusitis in an Immunocompetent COVID-19 Positive Patient**

Ramya Bharathi, MD, Boston, MA; Navya Baranwal, BS, Providence, RI; Alexander Marston, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the disease pathology and treatment of a rare case of necrotizing sinusitis in an immunocompetent patient of bacterial and thrombotic etiology in the setting of a COVID-19 infection.

Objectives: Report a rare case of an invasive bacterial and thrombotic related necrotizing sinusitis in a healthy, immunocompetent adult in the setting of a COVID-19 infection. The acute surgical management and partial rhinectomy reconstruction are herein described. **Study Design:** Case report and literature review. **Methods:** A comprehensive literature review and case study was completed related to necrotizing sinusitis in the setting of COVID-19. **Results:** The patient presented with known COVID positivity and left sided nasal and periorbital edema and erythema that progressed to nasal tip and sinonasal necrosis. MRI showed a thrombus in the left orbital vein. Acute surgical management required a partial rhinectomy and multiple endoscopic sinus debridements. Pathologic analysis of the sinus biopsies showed invasive *P. aeruginosa*. The patient subsequently underwent staged reconstruction of the full thickness nasal defect with placement of a folded paramedian fore-

head flap, recreation of the bilateral lower lateral cartilages with auricular cartilage grafting and tip contouring. Conclusions: *P. aeruginosa* can cause an aggressive, necrotizing sinonasal infection and present in a similar fashion to invasive fungal sinusitis due to similar vascular invasion and subsequent ischemia. In the case of the presented patient, it is theorized that COVID led to a thromboembolic state resulting in confirmed orbital vein thrombosis and likely additional subclinical microthrombi of the sinonasal region. In the setting of the COVID related thromboemboli, she likely became predisposed to the invasive necrotizing bacterial infection. This is the first reported case of invasive *Pseudomonas rhinosinusitis* depicted in a young, immunocompetent adult patient with COVID-19.

8. **Surgical Outcomes in Patients with Low Preoperative Sinonasal Outcome Test Scores**

Diana Jean Bigler, MD, Augusta, GA; Stilianos Emmanuel Kountakis, MD PhD, Augusta, GA; Adam Turry, BS, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss possible subjective and objective improvements in patients with low preoperative SNOT-22 scores who undergo functional endoscopic sinus surgery.

Objectives: The Sino-Nasal Outcome Test (SNOT-22) is a validated outcome measure used to quantify symptoms of chronic rhinosinusitis in patients preoperatively and postoperatively. Our objective was the study of the subjective and objective postoperative measurements of sinonasal manifestations in patients with low preoperative SNOT-22 scores. **Study Design:** Retrospective cohort study. **Methods:** All patients with rhinosinusitis referred to our tertiary care rhinology clinic from 2008 to 2021 with preoperative SNOT-22 scores less than 30 who underwent functional endoscopic sinus surgery were included in this study. Sino-Nasal Outcome Test (SNOT-22) scores and Lund-Kennedy (LK) endoscopy scores were reviewed before and after surgical intervention. **Results:** One hundred twenty-seven patients with chronic rhinosinusitis were identified who had preoperative SNOT-22 scores less than thirty. Preoperative and postoperative SNOT-22 scores for this patient population showed a decrease of 6.5 ($p < 0.01$, [5.1-7.9]). SNOT-22 scores were also analyzed for patients with a preoperative score less than fifteen and showed a decrease of 2.6 ($p < 0.01$, [1.3-3.9]). LK scores for patients with a preoperative SNOT-22 score less than fifteen also statistically decreased by an average of 3.8 ($p < 0.01$, [3.0-4.6]). **Conclusions:** Patients with low SNOT-22 scores less than 15 who undergo functional endoscopic sinus surgery show subjective and objective improvement in sinonasal disease.

9. **Rhinological Symptom Characteristics of Patients with Chronic Rhinosinusitis and Comorbid Irritable Bowel Disease**

David James Cvanara, BS, Seattle, WA; Thomas Blaise Marshall, MS, Norfolk, VA; Julio Alejandro de Leon, BS, Seattle, WA; Aria Jafari, MD, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe early findings seen in patients with concurrent chronic rhinosinusitis and irritable bowel disease.

Objectives: The purpose of this study was to describe the clinical characteristics of patients with chronic rhinosinusitis (CRS) and comorbid inflammatory bowel dis-

ease (IBD) compared to patients with CRS with nasal polyps (CRSwNP), and CRS without nasal polyps (CRSsNP) at a tertiary academic rhinology clinic. Study Design: Retrospective cohort study. Methods: Age matched patients were collected for each group (CRS-IBD=10; CRSwNP=10; CRSsNP=10). Rhinologic symptoms, SNOT-22 score, Lund-Mackay (LM) score, Lund-Kennedy (LK) score were collected from their initial clinic evaluation. Two tailed t test and chi squared analysis were used for comparisons. Results: CRS-IBD patients more frequently presented with nasal discharge (90%), relative to patients with CRSsNP (30%) and CRSwNP (70%). Symptoms of facial pain, nasal obstruction, and reduction in sense of smell were more similar among the groups. While there were no significant differences in overall SNOT-22 scores between groups, the CRS-IBD patients had significantly worse rhinologic, extranasal, and ear/facial domain scores compared to CRSsNP, yet this was not different between the CRS-IBD and CRSwNP groups. No significant differences in LM and LK scores were observed between groups. Conclusions: CRS-IBD patients experience increased nasal discharge symptoms and significantly worse rhinologic, extranasal, and ear/facial QOL symptoms compared to patients with CRSsNP. These differences were not seen when compared to the CRSwNP, suggesting potential underlying similarities in the disease mechanism. Larger studies are needed to validate these findings and to better understand the potential immunological underpinnings of this unique patient cohort.

10. **Objective and Subjective Olfactory Dysfunction among COVID-19 Inpatients and Controls: A Prospective, Case Control Study**

Thomas F. Cyberski, BS, Chicago, IL; Alexandra Tate, PhD, Chicago, IL; David O. Meltzer, MD PhD, Chicago, IL; Jayant M. Pinto, MD, Chicago, IL; Dara R. Adams, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the causes of viral associated olfactory dysfunction and to describe rates of smell dysfunction specific to COVID-19 compared to other viral illness.

Objectives: While olfactory dysfunction associated with COVID-19 infection is frequently described, how this compares to other viral illnesses is unknown. Thus, we compared rates of olfactory dysfunction between adults hospitalized with COVID-19 and controls admitted with similar upper respiratory symptoms who were COVID-19-negative. Study Design: Prospective case control study. Methods: Hospitalized (general ward) adults with upper respiratory symptoms who tested positive or negative for COVID-19 (PCR) completed the objective Brief Smell Identification Test (BSIT; ≥ 9 correct=normal) and subjective assessments while hospitalized and at 3 month followup. Comparison of groups was performed with a t test or chi square test of independence. Results: There were no differences in mean age (54 +/- 18 vs. 60 +/- 21, $p=0.27$) or sex (42% male vs. 43% male, $p=0.97$) between groups ($n=26$ covid, $n=28$ control). Both covid and control inpatients demonstrated objective olfactory dysfunction (mean BSIT 7.9 +/- 2.8 covid vs. 8.3 +/- 3.2 control, $p=0.62$). There was no difference in rate of objective (58% covid vs. 39% control, $p=0.18$) and subjective (27% covid vs. 25% control, $p=0.87$) dysfunction. Followup data at 3 months was limited but suggested minimal improvement at 3 months: mean BSIT 7.8 +/- 5.0 covid ($n=4$), 9.0 +/- 2.9 control ($n=4$). Conclusions: SARS-CoV-2 and other viral illnesses serious enough to cause hospitalization cause olfactory dysfunction. Better understanding of the trajectory of chemosensory recovery will help elucidate the pathophysiology of viral associated olfactory dysfunction and inform the care of patients suffering from its

sequelae.

- 11. An Integrated Biocomputational Approach to Esthesioneuroblastoma Identifies Potential Therapeutic Strategies**
John B. Finlay, AB MPhil, Durham, NC; Ralph Abi Hachem, MD, Durham, NC; David Jang, MD, Durham, NC; Bradley J. Goldstein, MD PhD, Durham, NC

Educational Objective: Esthesioneuroblastoma (ENB), also known as olfactory neuroblastoma, is a rare tumor that arises from the olfactory epithelium (OE). ENB can be aggressive and invade into the anterior skull base, with high grade tumors having a median 2 year survival less than 40%. Given the low prevalence of these tumors, the cellular mechanisms of ENB are poorly understood.

Objectives: We use a biocomputational approach to characterize the transcriptional programming of low and high grade ENB, with the goal of identifying novel treatment strategies. **Study Design:** Given our extensive experience analyzing normal and diseased human OE at a single cell level, we used OE single cell RNA-Seq (scRNA-Seq) datasets obtained from our lab to deconvolute previously published bulk RNA-Seq datasets. **Methods:** Using an integrated scRNA-Seq dataset containing 16 normal OE samples, we used a bioinformatics pipeline to deconvolute bulk RNA-Seq datasets from 3 normal human OE and 19 ENB samples. We further characterized the 19 ENB samples using DeSeq2 in R and validated some of these findings with immunohistochemistry in ENB patient samples. **Results:** Deconvolution reveals that grade I and II tumors map closely to immediate neural precursor cells and immature olfactory neurons, while an increased proportion of grade III and IV tumors are composed of cells that map to globose basal cells. We observe a modest increase in the proportion of CD8+ tumor infiltrating lymphocytes in higher grade tumors, with no differences in myeloid or CD4+ immune populations. Finally, we identify EZH2, an epigenetic regulator in olfactory basal cells, as being highly correlated with the Ki67 content of tumors; immunostaining confirms that nearly all Ki67+ cells are also EZH2+. **Conclusions:** Our results suggest that an EZH2 inhibitor, which is currently FDA approved for epithelioid sarcoma, may be a suitable treatment option for ENB. Furthermore, given the positive correlation between CD8+ lymphocytes and tumor grade, immune checkpoint blockade may provide benefit in high grade tumors.

- 12. Medication Compliance between Surgically vs. Nonsurgically Managed Patients with Chronic Rhinosinusitis or Allergic Rhinitis**
Jaynelle Gao, MS, Los Angeles, CA; Kevin Hur, MD, Los Angeles, CA; Benjamin Tam, BS, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, participants should be able to appreciate that compliance with nasal medications is different between patients with chronic rhinosinusitis (CRS) or allergic rhinitis (AR) who have had surgery compared to those who have not.

Objectives: This study seeks to compare the compliance of medical therapies between rhinology patients who pursued surgical management and those who did not. **Study Design:** Retrospective cohort. **Methods:** All otolaryngology patients seen for nasal or sinus complaints were screened. Patients treated for chronic rhinosinusitis (CRS) and allergic rhinitis (AR) were included in the study. Adherence to medications and demographic information were obtained from medical records.

Sinus disease severity was graded using the Sino-Nasal Outcome Test (SNOT-22). The study cohort was grouped by patients who underwent nasal or sinus surgery at any time versus those who only pursued medical management. Pearson's chi squared test was used to assess relationships between sociodemographic and clinical covariates. Multivariable logistic regression was used to assess the relationship between groups and medication adherence. Results: Our study cohort comprised 26 surgically managed and 24 nonsurgically managed patients. Both groups had similar age, sex, marital status, and health insurance. Nonsurgically managed patients were more likely to be Asian compared to surgically managed patients (50% vs. 13%, $p = 0.019$). SNOT-22 scores were similar between both groups (28.6 +/- 23.9 vs. 31.7 +/- 21.2, $p = 0.686$). On multivariate analysis, surgically managed patients were more likely to be compliant with medications after adjusting for age, sex, and race (OR = 2.43; 95% CI: 1.89-68.16; $p = 0.008$). Conclusions: Surgically managed CRS/AR patients were more likely to be compliant with their prescribed postoperative medical regimen compared to nonsurgically managed patients, even though disease burden was comparable between the two groups.

13. **Cavernous Sinus Thrombosis in the Setting of Acute COVID-19**

Ameer N. Ghodke, MD, Chapel Hill, NC; Saangyoung Eric Lee, MD, Chapel Hill, NC; Erin M. Lopez, MD, Chapel Hill, NC; Daniel Alicea, MD, Chapel Hill, NC; Brent A. Senior, MD, Chapel Hill, NC; Adam J. Kimple, MD PhD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should have heightened awareness of the risk of sinus disease and thromboembolic events in the setting of COVID-19 infection.

Objectives: To describe two cases of cavernous sinus thrombosis in patients presenting with sinus disease and acute COVID-19 infection. Study Design: Clinical case study. Methods: Two patient cases of cavernous sinus thrombosis were recently treated at our institution. Both patients were noted to have sinusitis with acute COVID-19. Results: A 71 year old female with a history of chronic sinusitis presented with bilateral acute sinusitis with COVID-19 and hypotension. She was found to have left sided cranial nerves 3, 4, and 6 palsies and bilateral cavernous sinus thrombosis. She underwent bilateral sphenoidotomies and a right sided FESS. Blood cultures grew *Enterobacter*, streptococcus, and klebsiella. Sinus cultures grew mixed anaerobes and aerobes. Her clinical status improved following treatment with broad spectrum antibiotics and anticoagulation. A 13 year old male who presented with a two week history of upper respiratory symptoms was found to be COVID positive. He soon developed acute onset headache, emesis, periorbital swelling, altered mental status, and right upper extremity weakness. Imaging was also significant for pontine and frontal lobe ischemia, and bilateral cavernous sinus thrombosis in the setting of bilateral pansinusitis. He underwent a bilateral FESS with orbital decompression. Although he was treated with broad spectrum antibiotics and anticoagulation, he had progressive arterial embolic infarctions with declining neurological function and succumbed to the disease. Conclusions: It is unknown how COVID-19 alters the barrier function of the sinonasal cavity; however, we have noted increases in cases of intraorbital and intracranial complications of patients with concurrent sinus disease and COVID-19.

14. **Progression of Noninvasive Fungal Sinusitis to Invasive Fungal Sinusitis: A Systematic Review**

Sabrina Shi-Rui Goyal, BS, St. Louis, MO; Michelle Doering, MLIS, St. Louis, MO; Peggy L. Kendall, MD, St. Louis, MO; Nyssa Farrell, MD, St. Louis, MO; John S. Schneider, MD MA FACS, St. Louis, MO; Lauren T. Roland, MD MSCI, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the prevalence of transformation from noninvasive fungal sinusitis to invasive fungal sinusitis. Participants should also appreciate that fungal sinusitis may exist as a dynamic spectrum of disease.

Objectives: Traditional classification of fungal sinusitis categorizes noninvasive and invasive fungal sinusitis as separate entities with distinct histopathology, treatment, and prognosis. However, recent reports cite cases of disease progression from noninvasive to invasive forms of fungal sinusitis. The purpose of this systematic review is to highlight cases of noninvasive fungal sinusitis that have transformed into or existed concomitantly with invasive fungal sinusitis. **Study Design:** Studies were obtained through PubMed, Embase, Ovid, Medline, Scopus, and Central, in accordance with PRISMA guidelines. Selected studies contained cases of noninvasive fungal sinusitis progressing to or diagnosed concomitantly with invasive fungal sinusitis. Studies were excluded based on the absence of histological evidence of invasive fungal sinusitis. **Methods:** Thirteen studies were included, all of which were case reports or case series. Primary outcomes included demographics, immune status, medical history, clinical course, noninvasive lesion site and disease, invasive lesion site and disease, histology, fungal culture, treatment, and patient outcome. **Results:** There was a total of 64 included patients. Immunocompetent patients comprised 68% of cases. The most common noninvasive disease states reported were fungus balls and allergic fungal rhinosinusitis, which presented at an equal rate. The most common invasive form was chronic granulomatous invasive fungal sinusitis (70%), which presented most frequently at the maxillary sinus (66.7%) and sphenoid sinus (43.9%). *Aspergillus* was the most common fungus identified (73.2%). Death was recorded in 8.9% of cases. **Conclusions:** Noninvasive fungal sinusitis can transform into invasive fungal sinusitis, even in immunocompetent patients. Fungal sinusitis may be considered as a fluid and dynamic spectrum of disease.

15. Effect of Intraoperative Analgesic Injection on Postoperative Pain Management in Patients Undergoing Functional Endoscopic Sinus Surgery

Syed Shahzeb Hasan, BS, Charlottesville, VA; Delaney Carpenter, MD, Charlottesville, VA; Rebecca Pierce, BS, Charlottesville, VA; Victoria Dailo, BS, Charlottesville, VA; Jose Mattos, MD, Charlottesville, VA; Spencer Payne, MD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, participants should be able to describe the postoperative pain and PACU length of stay effects of intraoperative analgesic injection in FESS.

Objectives: The objective of this study was to determine whether an intraoperative submucosal injection of local anesthetic impacts postoperative pain scores and narcotics use in the postoperative care unit among patients undergoing functional endoscopic sinus surgery (FESS). **Study Design:** Retrospective chart review. **Methods:** A chart review was performed of patients who underwent FESS

between October 2019 and May 2022. Inclusion criteria included patients with a diagnosis of chronic rhinosinusitis with or without polyps and those who underwent at least bilateral maxillary antrotomy and total ethmoidectomy, with or without sphenoidotomy, frontal sinus exploration, septoplasty, or inferior turbinate reduction. Exclusion criteria included a history of chronic pain with routine use of narcotics. Postoperative pain scores and intraoperative/postoperative narcotics use as measured by morphine milligram equivalents (MME) were compared between patients who underwent intraoperative lidocaine injection and those who did not using a student's T test. Results: Data from 83 FESS patients were examined, 40 of whom underwent local anesthetic injection intraoperatively at the start of the case. There was no statically significant difference in postoperative pain scores, MME, or length of surgery. There was a significant difference in PACU length of stay. When excluding patients who underwent septoplasty, there was no statically significant difference in postoperative pain scores, MME, or length of surgery. There was a significant difference in PACU length of stay. Conclusions: This study failed to demonstrate a statistically significant effect on postoperative pain scores after intraoperative local anesthetic injection, however, this analgesic modality has the potential to reduce PACU length of stay.

16. Sinonasal IgG4 Related Disease: A Rare Entity and Challenging Diagnosis

Andrew O. Hess, MD, Gainesville, FL; Brian C. Lobo, MD, Gainesville, FL; Marino Leon, MD, Gainesville, FL; Ernesto Martinez Duarte, MD, Gainesville, FL; Jennifer K. Mulligan, PhD, Gainesville, FL; Jeb M. Justice, MD, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the clinical manifestations of this disease and understand the subsequent pitfalls and challenges associated with this diagnosis.

Objectives: To describe the rare presentation, imaging and histological findings, and treatments in patients with IgG4 related disease (IgG4-RD) as well as diagnostic pitfalls and difficulties. Study Design: Retrospective chart review. Methods: Cases of sinonasal IgG4-RD were retrieved and clinicopathological features were reviewed. Results: Seven cases of sinonasal IgG4-RD were identified over an 11 year period, including four males and three females, with an age range of 19-66 years (median 58 years). Patients presented with symptoms related to the mass effect of the lesions or the destructive nature of the disease including fullness, swelling, obstruction, and pain. Serum IgG and IgG4 levels, IgG/IgG4 ratios, storiform fibrosis, obliterative phlebitis, and plasma cell infiltration were seen in varying proportions. Bony erosion and tissue inflammation were present in some cases. Conclusions: Sinonasal IgG4-RD is exceedingly rare among other IgG4-RD and varied in its clinical presentation thus posing as a clinically difficult disease to diagnosis. Proper clinical, pathological and immunohistopathological analysis is required for accurate diagnosis. Such disease should be considered in all cases of similar presentation to those in this study

17. Olfactory Dysfunction and TikTok: The Underutilization of a Potent Educational and Health Information Resource

Joseph Shen Lu, BS, Philadelphia, PA; Richard Wu, MPH, Philadelphia, PA; Maria Armache, MD, Philadelphia, PA; Nicholas Rowan, MD, Baltimore, MD; Leila J. Mady, MD MPH PhD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, participants should be able to recognize the utility TikTok has as a powerful patient educational resource and understand the opportunity that exists to potentially improve health outcomes, develop a professional network, motivate patients, and provide health information to the community.

Objectives: Olfactory dysfunction (OD) impacts nearly 1 in 4 adults but has only recently gained increased attention as a symptom of COVID-19 and long hauler symptomatology. We evaluated the quality and sources of OD related content on TikTok, a social media platform with 1 billion monthly users. **Study Design:** Cross-sectional observational study. **Methods:** Videos were searched using 30 OD related terms. Duplicate, non-English, or non-smell loss related videos were excluded. Content creators were categorized as otolaryngologist (MD), non-otolaryngologist physician (MD/DO), non-physician healthcare provider, non-healthcare licensed professional, and general users. User engagement was assessed by number of views, likes, comments, shares, duration, and days since upload. Educational quality was assessed using Global Quality Score (GQS) (range: 1-5), modified DISCERN score (range: 5-25), Patient Education Materials Assessment Tool-Understandability and Actionability (PEMAT-A/U) (range: 1-100%), and JAMA Benchmark Criteria (range: 0-4). **Results:** Of 447 videos, 363 were included, amassing 131,509,151 views, 15,477,339 likes, 267,804 comments, and 575,760 shares. Most frequently posted content were user experiences (47%), humor/entertainment (23%), and education (20%). Only 1 (0.28%) was posted by an otolaryngologist [vs. 320 (80%) general users]. Educational quality was poor: GQS (2.28 +/- 0.73); modified DISCERN (8.67 +/- 2.42); PEMAT-A/U (60.77 +/- 33.95, 80.12 +/- 19.53); JAMA Benchmark Criteria (0.32 +/- 0.52). Videos with higher GQS and DISCERN scores had less likes ($p < 0.05$). Videos created by general users had lower GQS and DISCERN scores (vs. professionals, $p < 0.001$). **Conclusions:** TikTok is used to seek and share information about OD and management strategies. Most educational content is low quality and not created by health professionals. TikTok represents an expansive growing social media platform with opportunities to improve high quality health information resources to the community.

18. **Clinical Impact of the STOP Act on Opioid Use for Postoperative Pain after (Adeno)tonsillectomy in Pediatric Patients**

Aurelia S. Monk, BA, Chapel Hill, NC; Brent A. Senior, MD, Chapel Hill, NC (Presenter); Landon J. Larabee, BSBA MBA, Chapel Hill, NC; Daniel Bacon, MD, Chapel Hill, NC; Charles S. Ebert, MD MPH, Chapel Hill, NC; Adam J. Kimple, MD PhD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how the STOP act regulations of opioid prescriptions may impede appropriate postoperative pain control in pediatric (adeno)tonsillectomies in certain age groups.

Objectives: To determine if new prescription regulations allow dispensing of sufficient pain medicine for patients undergoing pediatric tonsillectomies as reflected by refill rate. **Study Design:** Retrospective review of pediatric patients (less than 18) undergoing T&A. **Methods:** We reviewed medical records January 2019 - December 2019. Patients undergoing other surgeries requiring opioids for postoperative pain were excluded. Independent variables included length of stay after surgery and age. Refill rates and initial prescription rates were compared using

Fisher's exact tests and one way ANOVA tests. Results: 397 patients met inclusion criteria. 54.9% were five years and older and 45.1% were under five years. 77.5% of the older cohort and 26.8% of the younger cohort received an initial opioid prescription. Refill rates of the older and younger cohorts were 3.7% and 1.1%, respectively. The 10 year old group had the highest refill rate at 18.2%. Number of doses given for initial and refill prescriptions was similar between age groups. Of all patients, 66% were outpatients and 34% were admitted postoperatively. 63.3% of outpatients and 40.7% of the admits received an initial script. Number of doses in the initial scripts was 20.4 for outpatients and 18.7 for admits. Refill rate was not significantly different between outpatient and admit cohorts. Conclusions: Current opioid guidelines per the STOP Act are sufficient for children less than five undergoing tonsillectomies but may not be sufficient for children older than five. Consequently, patients older than five may require an increased number of initial opioid doses.

19. **Prevalence of Constipation after Endoscopic Skull Base Surgery**

Theodore V. Nguyen, BS, Orange, CA; Jonathan C. Pang, BA, Orange, CA; Arash Abiri, BS, Orange, CA; Ji Y. Li, BS, Orange, CA; Frank P.K. Hsu, MD PhD, Orange, CA; Edward C. Kuan, MD MBA, Orange, CA

Educational Objective: At the conclusion of this presentation, the participants should better understand the factors that contribute to constipation after endoscopic skull base surgery (ESBS).

Objectives: Postoperative constipation in endoscopic skull base surgery (ESBS) may provoke undesired straining which, in theory, may affect skull base reconstruction. The purpose of this study is to assess the prevalence and contributing factors to postoperative constipation after ESBS. Study Design: Retrospective chart review. Methods: Patients undergoing ESBS between July 2018 and July 2020 at a single center, tertiary academic skull base surgery program were retrospectively reviewed. Chart reviews were performed to identify average bowel movements per day, indication for surgery, age, sex, BMI, history of chronic pain, length of postoperative bedrest, LOS, and postoperative use of opioid analgesics. Additionally, use of standing stool softeners, as needed (PRN) stool softeners, and enemas were recorded. Constipation was defined as greater than two days without a bowel movement. Results: Ninety-six patients were identified, of which 68 (71%) patients had postoperative constipation. Postoperative constipation was associated with increased bedrest (2.46 +/- 0.41 vs. 1.11 +/- 0.19 days; p=0.040), increased morphine equivalent dose (MED) during POD2 (24.48 +/- 3.30mg vs. 11.62 +/- 3.85mg; p=0.026), POD3 (22.72 +/- 3.13mg vs. 8.34 +/- 2.18mg; p=0.006), POD4 (17.42 +/- 2.96mg vs. 7.32 +/- 2.60mg; p=0.043) and total postoperative MED (106.70 +/- 14.01mg vs. 46.88 +/- 8.44mg; p<0.001). There were no significant differences in postoperative CSF leak between the groups (1% vs. 4%; p=0.500). On multivariate regression, bedrest was found to be the only independent predictor of postoperative constipation (OR 4.70, 95% CI 2.06-10.75). Conclusions: Postoperative constipation rates were high after ESBS and were associated with increased immobilization and postoperative opioid use. Standing bowel regimens should be considered in these patients. There is no apparent association with reconstructive outcomes.

20. **Anatomic Relationship between the Head of the Middle Turbinate and First Olfactory Filum: A Radiographic Assessment**

Isaac Obermeyer, MD, Orange, CA; Cecilia Nguyen, BS, Orange, CA;

Frederick Yoo, MD, Anaheim, CA; Rohit Garg, MD, Anaheim, CA; Edward Kuan, MD MBA, Orange, CA

Educational Objective: At the conclusion of this presentation, the participants will understand the anatomic relationship between the head of the middle turbinate (HMT) and the first olfactory filum (FOF).

Objectives: The FOF has been identified as an important anatomical marker in Draf type III frontal sinusotomy. Despite the significance of this structure, it can be challenging to localize endoscopically. Failure to recognize the FOF could result in inadvertent cerebrospinal fluid leak. This study evaluated the position of the HMT in relation to the FOF to determine its feasibility as a landmark in endoscopic sinus surgery (ESS). **Study Design:** Radiographic study. **Methods:** A series of computed tomography scans of the sinus were reviewed. A reproducible process was implemented to obtain the measurements. The FOF was identified on an axial series. Using a localization feature within the radiographic software, this anterior-posterior (AP) position could be used to ultimately make a measurement between the HMT and the FOF in a sagittal plane. **Results:** The AP distance between the HMT and the FOF was measured in 92 patients. The HMT was either at or anterior to the FOF in all subjects. The mean distance between the HMT and FOF was 3.6 mm (+/- 2.4 mm) on the right, 3.8 mm (+/- 2.2 mm) on the left, and 3.7 mm (+/- 2.2 mm) for both sides. The AP distance ranged from 0 mm to 12 mm. **Conclusions:** In our study, the HMT was reliably at or anterior to the FOF in all subjects, suggesting its utility as a fixed landmark in ESS. A protocol to measure this distance on individual patients is provided.

21. **Clearing the Air: Acute Invasive Fungal Rhinosinusitis in Hematologic Cancer Patients**

Ezra Pak-Harvey, BA, Atlanta, GA; Elizabeth Willingham, MD, Atlanta, GA; Daniel Lubin, MD, Atlanta, GA; Amy Chen, MD, Atlanta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to acknowledge the impact of air quality on rates of fungal disease and consider the impact that adequate air conditioning and circulation may have on preventing invasive fungal rhinosinusitis.

Objectives: Air quality has been shown to impact rates of fungal disease, particularly in immunocompromised patients. We theorize that patients with hematologic malignancies in units with aging air handling units (AHUs) have a higher incidence of acute invasive fungal rhinosinusitis (AIFRS) cases. **Study Design:** Case series. **Methods:** Retrospective chart review was performed to identify patients with hematologic malignancy and AIFRS. Cubic feet per minute (CFM) air flows were compared. From 2013-2017, patients were confirmed to be in the older inpatient floor with AHUs installed in 1987. After 2017, patients were housed in the newest inpatient floor. AIFRS incidence rates and clinical data were compared between the two groups and statistical analyses were performed. **Results:** The older AHUs were found to produce air flow of 27,610 CFM and the newer AHUs an air flow of 80,000 CFM. There were 18 patients with air supplied by older AHUs and 7 patients with air supplied by new AHUs who developed AIFRS. There was statistically significantly more AIFRS cases for patients supplied by the older AHUs compared to patients supplied by newer ACUs ($p = 0.027$). The patients supplied by the older AHUs also tended to be younger. The white blood cell counts, absolute neutrophil counts, and the mean time to diagnosis did not differ between the two groups.

Conclusions: To our knowledge, this is the first study to examine AIFRS in immunocompromised patients' inpatient environment. More research is needed to explore if higher CFM AHUs can help decrease this potentially lethal disease among our most vulnerable patients.

22. **Risk Factors of Urinary Tract Infection following Endoscopic Skull Base Surgery**

Jonathan C. Pang, BA, Orange, CA; Arash Abiri, BS, Irvine, CA; Theodore V. Nguyen, BS, Irvine, CA; Kelsey M. Roman, BS, Irvine, CA; Frank P. K. Hsu, MD PhD, Irvine, CA; Edward C. Kuan, MD MBA, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize factors that may elevate risk of postoperative urinary tract infection in skull base surgery patients.

Objectives: Hospital acquired catheter associated urinary tract infections (UTIs) have been regarded as preventable adverse events, yet their risk in endoscopic skull base surgery has not been well described despite common use. We determine incidence of UTI following endoscopic skull base surgery and identify contributing clinical factors. Study Design: Case series. Methods: Retrospective chart review was conducted at a single center, tertiary academic skull base surgery program including consecutive adult patients who underwent endoscopic endonasal surgery for treatment of any skull base pathology between July 2018 and June 2022. Results: Nosocomial UTIs were identified in 1.3% (3/230) of patients, occurring on postoperative days 2, 9, and 14, respectively; all were catheter associated. Overall, 86.1% (198/230) of patients received urinary catheters (mean duration 2.2 +/- 1.8 days). Compared to those without UTI, patients experiencing UTI were older (70.0 +/- 15.4 vs. 52.0 +/- 17.0, $p=0.034$), had lengthier stays (94.7 +/- 126.8 vs. 5.9 +/- 8.4 days, $p<0.001$), and had prolonged catheterizations (9.3 +/- 5.5 vs. 2.1 +/- 1.5 days, $p<0.001$). Preoperative genitourinary conditions were also associated with UTI development, namely, urinary retention/obstruction (66.7% vs. 4.0%, $p=0.006$), urinary incontinence (66.7% vs. 6.2%, $p=0.013$), prostate disease (100.0% vs. 17.6%, $p=0.035$), and renal dysfunction (100.0% vs. 9.7%, $p=0.001$). Conclusions: Although UTIs are uncommon in endoscopic skull base surgery patients, advanced age, length of stay, duration of indwelling urinary catheterization, and comorbid genitourinary conditions may elevate risk.

23. **Comparing Healthcare Utilization between Open and Endoscopic Approaches for Inpatient Septoplasty**

Aman M. Patel, BS, Newark, NJ; Joel S. Feier, BA, Burlington, VT (Presenter); Vraj P. Shah, BS, Newark, NJ; Amar D. Desai, MPH, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the influence of surgical approach on the postoperative course of patients who undergo inpatient septoplasty.

Objectives: The influence of open versus endoscopic approach on the management and outcomes of patients undergoing septoplasty remains unclear. Our study characterizes the influence of surgical approach on the postoperative course of

patients who undergo inpatient septoplasty. Study Design: Retrospective database study. Methods: The 2017 National Inpatient Sample (NIS) was used to identify adult inpatients with a primary procedure related to septoplasty. Univariate and multivariable analyses were performed to describe statistical correlations with surgical approach. Results: Of the 425 inpatients who underwent septoplasty, the majority were male (61.2%), White (71.3%), and were operated on with an open surgical approach (67.1%). The mean age of patients in our cohort was 50.5 years. Patients who underwent endoscopic septoplasty had higher incidence of hypothyroidism (21.4% vs. 5.3%, $p<0.001$) and rheumatoid arthritis (10.7% vs. 1.8%, $p<0.001$), but lower incidence of obesity (14.3% vs. 33.3%, $p<0.001$) and alcohol abuse (0.0% vs. 12.3%, $p<0.001$) than those who underwent open septoplasty. On multivariable analyses, adjusting for patient demographics, hospital data, and severity of illness, patients who underwent endoscopic septoplasty had greater total charges (\$53,423 vs. \$45,019, $p<0.001$), length of stay (LOS) (3.5 vs. 3.0 days, $p<0.001$), and number of procedures undergone (6.1 vs. 4.5 procedures, $p<0.001$) than those who underwent open septoplasty. Conclusions: Inpatients undergoing septoplasty with an endoscopic approach had greater total charges, LOS, and number of procedures undergone than those with an open approach.

24. **Evaluating Sinonasal Malignancy Management by Hospital Bed Size**

Aman M. Patel, BS, Newark, NJ; Joel S. Feier, BA, Burlington, VT (Presenter); Vraj P. Shah, BS, Newark, NJ; Amar D. Desai, MPH, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss correlations between hospital bed size and the management of inpatients with diagnosed sinonasal malignancy.

Objectives: Hospital bed size has been shown to affect the management and outcomes of patients admitted for various surgical and medical procedures. Our study examines the correlations between bed size and the management of inpatients diagnosed with sinonasal malignancy. Study Design: Retrospective database study. Methods: The 2017 National Inpatient Sample (NIS) was used to identify adult inpatients with a primary diagnosis related to malignant neoplasm of the nasal cavity or accessory sinuses. NIS divides hospitals based on their bed size into small hospitals (SH), medium (MH), and large (LH). Univariate and multivariable analyses were used to characterize statistical correlations between hospitals of varying bed sizes. Results: Of the 1,600 inpatients diagnosed with sinonasal malignancy, the majority were male (64.1%), White (66.2%), and treated at a LH (75.9%). Patient demographics including age, sex, race, income, and severity of illness significantly varied by hospital bed size ($p<0.001$). On multivariable analyses adjusting for patient demographics, hospital data, and severity of illness, patients treated at a SH had fewer total charges (\$56,492 vs. \$120,094, $p=0.041$), greater length of stay (LOS) (9.3 vs. 6.7 days, $p<0.001$), higher mortality (OR 14.70, 95% CI 4.78-45.21, $p<0.001$), and fewer procedures undergone (3.8 vs. 6.0 procedures, $p=0.017$) as those treated at a LH. Patients treated at a MH had shorter LOS (5.6 vs. 6.7 days, $p=0.035$), but similar total charges (\$114,673 vs. \$120,094, $p=0.403$), number of procedures undergone (6.2 vs. 6.0 procedures, $p=0.778$), and mortality (OR 0.69, 95% CI 0.23-2.03, $p=0.499$) compared to those treated at a SH. Conclusions: Management of inpatients diagnosed with sinonasal malignancy varied by hospital bed size.

25. **Draf III Frontal Sinusotomy for Frontal Intersinus Septal Schwannoma**

Tiffany Thienthao Pham, MD MS, Aurora, CO; Justin Honce, MD, Aurora, CO; David A. Zander, MD, Aurora, CO; Visesh Ravikumar, MD, Aurora, CO; Anne Getz, MD, Aurora, CO

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that schwannomas, although extremely rare, should be included in the differential for frontal bone masses.

Objectives: Schwannomas are benign, slow growing tumors that originate from peripheral nerve sheath cells, called Schwann cells. Although schwannomas are frequently found in the head and neck, schwannomas found in the anterior cranial fossa and sinonasal tract are extremely rare. **Study Design:** Herein, we present a patient case of a schwannoma located at the foramen cecum and frontal intersinus septum. **Methods:** A 35 year old female, with symptoms of frontal headaches, was referred by her neurologist to our otolaryngology clinic for MRI findings of an interfrontal sinus septum mass. This expansile mass was well defined and avidly enhancing, but without specific radiographic features. Computed tomography showed the foramen cecum diving into the superior aspect of the mass, as well as expansible frontal intersinus septum bony changes around the mass without erosion. **Results:** The patient underwent a Draf III frontal sinusotomy for surgical excision of the tumor and treatment of headaches. Pathology showed a spindle tumor with fibrillary background, areas with fascicular architecture, and focally Verocay bodies, consistent with a schwannoma. Immunohistochemistry showed that the tumor stained S-100 positive. **Conclusions:** Although extremely rare, schwannomas should be in the differential for a midline frontal bone mass. As imaging findings are nonspecific, diagnosis should be determined by surgical biopsy or excision of the mass.

26. **Impact of Acromegaly on Transsphenoidal Pituitary Surgery Management and Outcomes**

Anthony M. Saad, BA, Newark, NJ; Aman M. Patel, BS, Newark, NJ; Imran M. Khawaja, BA, Newark, NJ; Sudeepti Vedula, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to see the impact of acromegaly on inpatient transsphenoidal pituitary surgery management and outcomes.

Objectives: Acromegaly involves growth hormone hypersecretion and is associated with multisystem disease. Our study investigates the impact of acromegaly on the management and outcomes of inpatient transsphenoidal pituitary surgery (TSPS). **Study Design:** Retrospective database study. **Methods:** The 2017 National Inpatient Sample (NIS) was queried to identify adult patients undergoing TSPS. Acromegaly was identified (ICD-10: E22.0). Univariate and multivariable analyses were performed to identify statistical associations with acromegaly status. **Results:** Of the 3,605 patients who underwent TSPS, the majority were female (50.8%), White (58.4%), and did not have acromegaly (94.5%). Mean patient age was 54.0 years. Patients with acromegaly had higher incidence of diabetes mellitus (42.5% vs. 20.7%, $p < 0.001$) but lower incidence of hypothyroidism (17.5% vs. 28.8%,

$p < 0.001$) and fluid and electrolyte disorders (5.0% vs. 17.6%, $p < 0.001$). Patients with and without acromegaly had similar incidence of hypertension (45.0% vs. 52.4%) and obesity (17.5% vs. 22.3%) (p greater than 0.05). On multivariable analyses, adjusting for patient and hospital characteristics, patients with acromegaly had decreased length of stay (LOS) (2.5 vs. 4.9 days, $p = 0.002$) and number of procedures undergone (NPU) (2.9 vs. 3.3 procedures, $p = 0.020$) but similar total charges (\$72,383 vs. \$108,034, $p = 0.404$) as patients without acromegaly. Odds for cerebrospinal rhinorrhea (OR 1.39, 95% CI 0.84-2.30), postoperative neurological complications (OR 0.61, 95% CI 0.24-1.60), and urinary and renal complications (OR 1.54, CI 95% 0.54-4.38) did not vary by acromegaly status (p greater than 0.05). Conclusions: In a national TSPS inpatient cohort, acromegaly was associated with decreased LOS and NPU but similar total charges and postoperative complications.

27. Perceived Benefits and Influence on Medical Decision Making of Online Support Groups on the Treatment of Chronic Rhinosinusitis (CRS)

Ruben Ulloa, BA, Los Angeles, CA; Francis Reyes Orozco, BS, Los Angeles, CA; Benjamin Tam, BS BA, Los Angeles, CA; Kevin Hur, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the perceived psychosocial benefits of online support groups for their users and how patient medical decision making is affected by membership in online support groups.

Objectives: Describe the characteristics of patients in online CRS support groups, its influence on medical decision making and perceived psychosocial benefits. Study Design: This descriptive study used an online survey to gather data from members of an online support group. This data includes sociodemographic information, psychosocial benefits and effects on medical decision making. Methods: A survey was adapted from the existing literature in patient support groups and further developed by a rhinologist. A survey was posted on multiple Facebook/Reddit groups aimed at providing support toward patients with CRS. Survey data was collected over three months and analyzed thereafter. Results: There were 139 total participants. 87 (62.6%) were female, 106 (76.8%) were white, the average age was 40. 57 (47.5%) reported that they had nasal polyps. 71 (53.4%) participants reported that the online support groups probably or definitely influenced their medical decision making while 46 (34.3%) of participants reported that the groups definitely did not influence which type of doctor they saw. 89.5% of participants reported slightly to very positive feelings towards gaining knowledge of CRS through the group. 75.2% report receiving positive social support from the group and 65% of people report learning positive coping skills. Conclusions: Patients reported benefits from inclusion in online support groups for CRS. There is a role for the patient centered support group for sinus disease that can potentially be hosted by academic centers or professional societies similar to how cancer support groups are structured.

28. Thematic Content Analysis of an Online Support Group for Chronic Rhinosinusitis

Ruben Ulloa, BA, Los Angeles, CA; Benjamin Tam, BS BA, Los Angeles, CA; Francis Reyes Orozco, BS, Los Angeles, CA; Kevin Hur, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role that the online support group plays in the chronic rhinosinusitis (CRS) population.

Objectives: Chronic rhinosinusitis is a chronic disease that is often refractory to medical and surgical treatment. Support groups have long existed for a variety of pathologies and the world's increasing reliance on the internet has supported the development of the online support group as a novel therapeutic tool. This study was performed to better understand the role that the online support group plays for patients with CRS. **Study Design:** This descriptive study evaluated the content of a large online support group to objectively categorize and define its data. **Methods:** The largest online community for individuals with CRS, chronic sinusitis sufferers, was examined. A thematic content analysis of the communications shared in May, 2022 was performed. A conventional grounded theory qualitative analysis model was employed to analyze aggregated data. The data were then codified and reviewed by two reviewers independently. **Results:** There were 181 total posts aggregating 1145 total codes. 175 posts were made by females. 77.4% of codes were in the information themes while 19.7% and 5% posts were in the emotional expression and community building themes. The tone for these posts was overwhelmingly neutral. Within the information theme, most posts were neutral and elicited (22%) information with some of the most common info requested being general CRS and medication information. **Conclusions:** Patients are frequently seeking and sharing information about CRS on web based platforms. It is important for providers to understand where patients source their information. Further studies are required to verify the accuracy of the information provided in the online communities.

29. **The Readability of Sinonasal Disease Specific Quality of Life Surveys**

Abdullah Zeatoun, MD, Chapel Hill, NC; Meredith Lamb, BS, Apex, NC; Taylor Stack, BS, Chapel Hill, NC; Sulgi Kim, BS, Chapel Hill, NC; Brent Senior, MD, Chapel Hill, NC; Adam Kimple, MD, PhD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to know what specific components of the Rhinosinusitis Disability Index (RSDI) and Sinonasal Outcome Test (SNOT-22) are above the recommended readability level and with simple alterations to the text, we could lower the surveys' readability and make it easier for patients to read and understand.

Objectives: The readability of the major sinonasal disease specific Quality of Life (QOL) surveys are above the recommended sixth grade level. Therefore, this study aimed to determine what specific components of the Rhinosinusitis Disability Index (RSDI) and Sinonasal Outcome Test (SNOT-22) are above the recommended readability level and proposes alternative text to improve the readability of the surveys. **Study Design:** Three validated readability metrics: 1) Gunning Fog, 2) Simple Measure of Gobbledygook (SMOG), and 3) FORCAST- were used to analyze the readability of the RSDI and SNOT-22. In addition, we developed alternative text to improve the readability of the RSDI and SNOT-22 to make it consistent with the recommended readability level. **Methods:** The three readability metrics evaluated the readability of the surveys. Higher than sixth grade readability level was considered above the recommended readability level. **Results:** The Gunning Fog, SMOG, and FORCAST readability was 9th, 10th, and 11th grade for

the RSDI and was 5th, 7th, and 11th grade for the SNOT-22, respectively. Most of the questions (26-28 out of total 30 questions) for the RSDI and (4-16 out of total 22 questions) for the SNOT-22 were above the recommended 6th grade reading level. The proposed alternative text improved grade level readability for both surveys. Conclusions: Unfortunately, the RSDI and SNOT-22 readability are above the recommended level. However, with simple alterations to the text, we could lower the surveys' readability and make it easier for patients to read and understand. Additional validation studies will be needed to confirm the tools still capture relevant components of sinonasal QOL.

Facial Plastic and Reconstructive

30. International Collaboration Trends in Facial Plastic and Reconstructive Surgery: A Literature Review

Julia Canick, AB, Durham, NC; Gaelen B. Stanford-Moore, MD MPhil, San Francisco, CA; Samantha Kaplan, PhD, Durham, NC; Walter Lee, MD MHS, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to identify gaps in inclusive authorship trends in facial plastic and reconstructive surgery (FPRS) research in the global health setting. Participants should also be able to consider ways that future FPRS research might include authors from low and middle income countries.

Objectives: Over the last two decades there has been increased involvement of international work in the field of facial plastic and reconstructive surgery (FPRS). The goal of this study is to 1) characterize and understand the existing published literature on FPRS care in a global health setting; and 2) report patterns in whether these manuscripts included authors from the low and middle income countries (LMICs) in which the studies took place. Study Design: Literature review. Methods: A literature review in Scopus was performed using a set list of search terms; studies were included using predetermined inclusion/exclusion criteria. Results: 286 studies met criteria for inclusion. The highest percentage of studies (25%) were conducted across multiple countries. 41.9% of studies discussed cleft lip/palate. 49.5% of studies included at least one author from the host LMIC; of these, 31% had first authors and 25% had senior authors from LMICs, respectively. 28% of studies (n=79) described humanitarian clinical service trips without mentioning research or education in the text. The remaining studies described research studies, education projects or a combination. The published literature on humanitarian service trips had the lowest rate of inclusion of a first or senior author from the host LMICs. Conclusions: There is a general trend of increased international work in the field of FPRS. However, there continues to be a paucity of inclusive authorship trends, with the majority of studies not including first or senior authors from LMICs. The findings presented here encourage new collaborations worldwide as well as the improvement of existing efforts.

31. Reconstruction of Composite Mandible Defects Using Cellular Bone Allograft within a Patient Specific Graft Cage and Soft Tissue Free Flap Coverage

Kevin James Carlson, MD, Norfolk, VA; Robert M. Liebman, MD, Savannah, GA; William M. Dougherty, MD, Norfolk, VA; Matthew J. Bak, MD, Norfolk, VA; Jonathan R. Mark, MD, Norfolk, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify soft tissue free flap coverage of a cellular bone matrix allograft within a patient specific graft cage as a reconstructive option for select composite mandible defects.

Objectives: Mandibular defects involving the symphysis and angle pose a reconstructive challenge despite advances in virtual surgical planning. Bone allografts can provide improved contour but their application in large composite defects is limited. We assess our experience with reconstruction of a composite mandibular defects using a cellular bone matrix allograft within a patient specific graft cage and soft tissue free flap coverage. Study Design: Case series of five patients undergoing reconstruction of composite mandibular defects. Methods: A patient specific allograft cage (Trumatch, DePuy Synthes) was used to span mandible defects and filled with cellular allograft bone matrix (ViviGen, DePuy Synthes). Free tissue transfer provided soft tissue coverage of the implant. Allograft take is retrospectively evaluated. Results: Patients (n=5) ranged in age from 23 to 56 years. Bony defects were 3-5cm, involved the symphysis (n=2), angle (n=2) and body (n=1), and the result of gunshot wounds (n=4) or oncologic resection (n=1). Soft tissue coverage was from radial forearm (n=3) or anterior lateral thigh (n=2) free flaps. Three patients had postoperative imaging demonstrating allograft take and union to the native mandible. A fourth patient did not undergo postoperative imaging but reported adequate occlusion at followup with closure of the soft tissue defect. A final patient developed an orocutaneous fistula and allograft failure necessitating revision with a fibula free flap. Conclusions: Reconstruction of composite mandible defects using bone allograft and soft tissue free flap coverage may offer an alternative to osteocutaneous free tissue transfer in select patients.

32. **Navigating Facial Reanimation Failures: Successful Revision or Salvage Methods for Patients with Facial Palsy**

Victor Alfonso de Cos, BS, San Diego, CA; Rishi Modi, BS, San Diego, CA; Sandhya Kalavacherla, BS, San Diego, CA; Jacqueline J. Greene, MD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe potential management strategies for revision of various facial reanimation procedures with initial failure or limited restoration.

Objectives: We describe three successful revision surgeries for variable free muscle transfer procedures with initially unsatisfactory restoration of facial nerve function. Study Design: Case report/series. Methods: Three patients with facial palsy following tumor resection each underwent secondary facial reanimation surgeries after failure to achieve facial movement. Patients 1 and 2 each underwent a 2 stage procedure with a cross-face nerve graft (CFNG) followed by a gracilis free flap and patient 2 underwent an additional 12-7 nerve transfer; neither achieved movement at 12 mos. Patient 1 underwent transfer of the nerve to masseter (NTM) to the gracilis flap 13 mos later. Patient 2 underwent single stage gracilis flap from the other leg and innervation by NTM 17mos later. Patient 3 had a 5-7 nerve transfer that restored some facial movement but not a readable smile. Patient 3 underwent a second stage gracilis by CFNG 20 mos later. Postop facial movement was tracked via photos and videos documented for 8 facial expressions. Results: In patients 1, 2, and 3 (ages 47, 46, and 54), additional procedures produced successful outcomes: patient 1 demonstrated a bite driven smile after 5 mos, patient 2 noticed gracilis movement after 7 mos, and patient 3 demonstrated gracilis move-

ment after 3-4 mos and developed a spontaneous smile. Conclusions: Limited reports on management strategies for facial reanimation surgery failure are currently available, and there is no frontrunner among the numerous facial reanimation procedures available. This case series demonstrates that facial reanimation can be achieved through secondary operations up to 20 mos after an initial failed reanimation procedure.

33. **The Effect of E-Prescribing on Narcotic Dispersion following Facial Reconstructive Plastic Surgeries**

Nadia Debick, BS, Syracuse, NY; Danielle Wilson, DO, Syracuse, NY (Presenter); Amar Suryadevara, MD, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the influence of state level policies on prescription practices.

Objectives: To explore the effect of e-prescribing requirements on narcotic dispersion following facial reconstructive plastic surgeries in our state. Study Design: Slicer Dicer was used to identify patient health records based on CPT codes for retrospective review. The primary independent variable was the onset of e-prescribing requirement. Methods: We investigated the following five common facial plastics procedures; ear graft, forehead flap, adjacent tissue transfers for any area or defect of the eyelids/nose/ears/lips, and rhinoplasty. We then looked at narcotic prescription rates following those surgeries between March 2014 and March 2018 at an academic institution. Results: Overall, between March 2014 and March 2018, 74.6% of the sample received a narcotic prescription following a facial reconstructive plastic surgery. Prior to e-prescribing, 79.4% of patients in the sample were prescribed narcotics. This rate fell to 70.5% after the onset of e-prescribing. However, these rates were not significantly different. However, CPT code was significantly associated with initial prescription of narcotics, $X^2(4) = 11.12$, $p = 0.25$. Those who underwent adjacent tissue transfer or rearrangement were significantly less likely to receive postoperative narcotics when compared to their counterparts who underwent other facial reconstructive plastic surgeries. Those who underwent repair, revision or reconstructive procedures of the head were most likely to receive postoperative narcotics. Patients who underwent rhinoplasty were most likely to request additional postoperative pain management. Conclusions: These data demonstrate the painful nature of these procedures, for which narcotics are often warranted for proper pain management. However, some procedures may require more intensive pain management and monitoring.

34. **Restoration of Oral Competence with Local Advancement Flap after Free Flap Reconstruction for Head and Neck Cancer**

Nicole G. DeSisto, BA, Nashville, TN; Amy L. Pittman, MD, Chicago, IL; Priyesh N. Patel, MD, Nashville, TN; Shiayin F. Yang, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to describe an innovative technique to improve oral competence after free flap reconstruction.

Objectives: Surgical management of head and neck cancer (HNC) can result in significant functional deficits. Large tumors of the oral cavity can require extensive resection and the need for microvascular free flap reconstruction. Single free flap reconstruction involves the use of adynamic tissue, resulting in oral incompetence,

drooling, difficulties with speech, and unsatisfactory aesthetic outcomes. Maintenance of the orbicularis oris and function of the oral sphincter are important objectives in the reconstruction of large defects. When this cannot be accomplished, secondary local flaps can be employed to restore the orbicularis oris. We present a series of cases of oral incompetence following microvascular free flap reconstruction for large resections of HNC. Study Design: Case series. Methods: All cases were managed with modified Karapandzic flaps and local advancement flaps to restore the function of the oral sphincter and improve oral competence. Results: The surgical techniques demonstrated in our cases resulted in improvement in both functional and aesthetic outcomes. Conclusions: Continuity of the orbicularis oris muscle should be the primary goal of single stage free flap reconstructive procedures to reduce the incidence of oral incompetence. However, when this cannot be achieved, restoration of the oral sphincter and oral commissure can be achieved with a secondary reconstructive procedures. Modified Karapandzic flaps can be used secondarily for restoration of oral competence following reconstruction with a single stage microvascular free flap.

35. **Second Harmonic Imaging of Nasal, Auricular, and Costal Cartilage**

Katelyn Khy Dilley, BS, Irvine, CA; Akarsh Lal, BS, Irvine, CA; Theodore V. Nguyen, BS, Irvine, CA; Clara Chao, Irvine, CA; Naya Sterritt, Irvine, CA; Brian J.F. Wong, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should better understand the histological organization of facial and costal cartilages in terms of matrix structure and cell morphology.

Objectives: Little is known about the histological organization of facial and costal cartilages in terms of matrix structure and cell morphology. Second harmonic generation (SHG) imaging is a nonlinear imaging technique that capitalizes on signal generation from highly ordered macromolecules such as collagen fibers. The purpose of this study was to use SHG microscopy to image collagen extracellular matrix (ECM) structure, chondrocyte size, and density of these cartilages. Study Design: Experimental. Methods: Surgical remnants of septal, lower lateral (alar), rib, and auricular cartilage were collected following surgery, sectioned into 0.5-1mm thick samples, and fixed to facilitate batch process imaging. A Leica TCS SP8 MP8 microscope and multiphoton femtosecond pulsed laser were used to image the specimens. Images were analyzed for cell size, cell density, and collagen fiber directionality patterns using ImageJ. Results: SHG images of septal specimens show meshlike structure of the ECM. There appears to be a superficial layer, characterized by flattened lacunae, and middle zone, marked by clusters of circular lacunae, similar to what is observed in articular cartilage. The structure of the ECM depicts a visible orientation perpendicular to the surface of the perichondrium. Cell size and density analysis through ImageJ suggests variety across cartilage types. Directionality analysis indicates that the collagen in the extracellular matrix displays a preferred direction. Conclusions: This study establishes clear extracellular models of facial and costal cartilages. Limitations include heterogeneous cartilage thickness due to processing difficulties. Further studies include automating the cutting process to increase uniformity of tissue thickness and increasing sample size to further validate results.

36. **Cosmetic Filler and PET Positivity: The Risk of False Positives**

Dana N. Eitan, BS, Phoenix, AZ; Lisa D. Grunebaum, MD, Phoenix, AZ; Brittany E. Howard, MD, Phoenix, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate that filler can be PET avid and feel comfortable counseling patients on potential implications of filler during oncologic surveillance.

Objectives: Discuss a case of hyaluronic acid filler displaying as PET avid resulting in a false positive for local recurrence and review of the literature of how filler presents on PET. Study Design: Case report and literature review. Methods: Retrospective case review of a patient with angiosarcoma with PET-MRI positivity after hyaluronic acid filler injection. Review of the literature was performed. Results: A 49 year old female with low grade angiosarcoma of the right cheek pT1N0M0 was treated with wide local excision and staged reconstruction with cervicofacial advancement flap and adjuvant radiation therapy. After one year without recurrence, HA injectable filler was offered to correct resultant right facial soft tissue defect. The patient proceeded with HA filler and was counseled on the risk of local increased SUV on imaging. Her PET/MRI 3 months later revealed postsurgical changes in the right premaxillary soft tissues with associated low grade hypermetabolism with max SUV 1.8, which elevated from prior max SUV 0.9. Contralateral left maxillary soft tissues revealed max SUV 0.8. Biopsy was initially favored for concern of local recurrence until the potential for filler to be associated with elevated SUV was discussed. Further evaluation with MRI showed diffusely increased T2 signal with some trace enhancement in the region of PET activity, confirming that findings were consistent with HA filler augmentation per the neuroradiologist team. Conclusions: Fillers, including hyaluronic acid, are associated with elevated SUV on PET-CT. Otolaryngologists should be aware of these features to improve patient counseling, avoid unnecessary procedures, and reduce patient anxiety.

37. **Postoperative Rhinoplasty Infections Due to Actinomyces**

Dana N. Eitan, BS, Phoenix, AZ; Lisa D. Grunebaum, MD, Phoenix, AZ; Brittany E. Howard, MD, Phoenix, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize actinomyces as a possible culprit for postoperative rhinoplasty infections and identify specific testing for actinomyces in high risk patients.

Objectives: To discuss a case series of actinomyces infection post-rhinoplasty and review the literature for correct diagnosis and management. Study Design: Case series with chart review. Methods: Three cases are presented of patients with a history of recurrent infectious symptoms post revision rhinoplasty later being diagnosed as actinomyces. Results: Three patients were identified having undergone revision rhinoplasty and later being diagnosed with actinomyces infection. They initially presented with underwhelming physical exams, mild erythema, slight swelling, yet extreme pain. They also had periods of recurrent infection once antibiotics were stopped. Aerobic, anaerobic, fungal, and actinomyces cultures were sent to pathology and returned positive for actinomyces. Treatment typically involved a combination of prolonged antibiotics, incision and drainage, and/or surgical debridement. Conclusions: Awareness of actinomyces as a possible cause of infection post-rhinoplasty is significant as this pathogen can lead to extensive tissue destruction and fistula formation which could be detrimental for a rhinoplasty. Duration of treatment is beyond typical lengths for other infections and a specific culture for actinomyces is required to be sent as it isn't captured in standard aerobic/anaerobic cultures. Therefore, a high index of suspicion is required by physicians

to ensure that patients are evaluated thoroughly.

38. Nonsurgical Interventions for Gender Affirming Facial Feminization: A Scoping Review

Sarah Elhachimi, BS, New York, NY; David Liao, MD, New York, NY; Mingyang L. Gray, MD MPH, New York, NY; Joshua Rosenberg, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify options for nonsurgical management for gender affirming facial feminization and understand the need for evidence based clinical care for the transgender patient population.

Objectives: To review existing literature regarding nonsurgical management for facial feminization commonly performed for transgender patients. To identify of gaps in current literature to highlight the necessity of gender affirming care for transgender patients. **Study Design:** The scoping review began by establishing a research team of individuals with expertise in facial plastic surgery and gender affirmation. Alongside an institution librarian, the team identified search terms and relevant databases. **Methods:** A scoping review was conducted using the Arksey and O'Malley framework. A comprehensive search was conducted in four bibliographic databases and the gray literature to identify the nature and extent of current nonsurgical management of facial feminization. Keywords specific to the transgender population and nonsurgical techniques were used. Review selection and characterization were performed by two independent reviewers. Data on techniques, outcomes, complications, patient satisfaction, provider satisfaction and future direction were collected. **Results:** The scoping search identified 264 literature sources. 49 were found to be potentially relevant publications and met the inclusion criteria for full text review. Nonsurgical management in gender affirming facial feminization includes injectables such as neurotoxin to reduce masseter muscle hypertrophy and fillers for lateral brow elevation and lip and malar augmentation. **Conclusions:** The majority of data reported in these sources included techniques used on cisgender patients that were adapted for the purpose of gender affirmation for transgender patients. There is a lack of high quality randomized, controlled trials specific to the transgender patient population that evaluate outcomes, patient satisfaction, or complications. Such studies would be needed to inform evidence based practices.

39. Considerations in Reconstructive Rhinoplasty for Maxillonasal Dysplasia (Binder's Syndrome)

Emily K. Gall, MD, Boston, MA; Ramya Bharathi, MD, Boston, MA; Andrew R. Scott, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) review the embryology of the nose and identify some of the genes implicated in nasal development; 2) describe a case of maxillonasal dysplasia (Binder's syndrome) and present a surgical approach to reconstructive rhinoplasty during childhood.

Objectives: To present a case of maxillonasal hypoplasia and suggest a surgical approach based on anatomic considerations that may be performed in childhood. **Study Design:** Case report and literature review. **Methods:** A case of maxillonasal dysplasia is discussed, and a literature review of nasal development and surgical

approaches to repair of maxillonasal hypoplasia is presented. Results: A patient with a 6q25.2 deletion and symmetric nasal hypoplasia presented in infancy allowing for serial photographic documentation of nasal her development over 9 years. The patient underwent primary reconstructive rhinoplasty at age 9. The caudal septum was absent, and the homologue of the anterior septal angle was posteriorly positioned and did not project beyond the pyriform aperture. Concha cavum and concha cymba grafts were harvested from the right ear to reconstruct the lower lateral cartilages and these were ultimately resuspended on a caudal septal extension graft, harvested from the posterior septum. A discussion of evaluation and management strategies for this entity is presented. Conclusions: Maxillonasal dysplasia or Binder's syndrome and its variants are uncommon and present as congenital midface hypoplasia with a flattened, often broad nasal tip. Careful planning and reconstruction of such defects as well as attention to structural integrity may yield a favorable functional and aesthetic result, however donor site materials must be considered in the context of the age of the child.

40. 3D Templating for Nasal Defect Reconstruction with Paramedian Forehead Flap: A Cadaveric Feasibility Study

Brittany E. Howard, MD, Phoenix, AZ; Dana N. Eitan, BS, Phoenix, AZ (Presenter); Michael McPhail, PhD, Phoenix, AZ; Jurgen Neubauer, PhD, Phoenix, AZ; David Lott, MD, Phoenix, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss options for utilizing 3D scanning and printing technology as a new templating technique for nasal reconstruction by paramedian forehead flap. They should be able to identify potential benefits of technique and equivalent outcomes compared to traditional paramedian forehead flap templating.

Objectives: Describe a cadaveric feasibility study utilizing a 3D scanning and printing for paramedian forehead flap template design compared to traditional template creation. Study Design: A cadaveric feasibility study. Methods: A unique cutaneous defect was created on three cadaveric cephalis including a 1) nasal tip defect; 2) heminasal tip with soft tissue triangle and ala defect; and 3) a total lower nasal defect. For each defect, a template for reconstruction was created by two methods: ex vivo directly on cadaveric cephalis versus created on a 3D printed model of the nose prior to defect creation. Three stage nasal reconstruction was then completed using the two available paramedian forehead flaps for each cephalis to compare the two template types. Comparisons between the two template types were collected both quantitatively (linear edge and surface area) and qualitatively (best fit and final outcome as judged by blinded observers). Results: The 3D created templates consistently had a smaller linear edge and surface area compared to the ex vivo created templates. No significant difference regarding best fit could be established by two blinded team members between the two templating methods. After completion of nasal reconstruction, no difference was perceived between the final results of the ex vivo template reconstruction versus the 3D model created reconstruction by the blinded observers. Conclusions: Nasal reconstruction with paramedian forehead flap reconstruction using a template based on 3D scanning and printing was feasible with equivalent final reconstructive outcomes relative to traditional template technique in this cadaveric feasibility study.

41. Botox and Facial Retraining Versus Selective Neurolysis as Treatments for Patients with Facial Synkinesis: Clinician Administered Quality of Life Outcomes

Joseph Shen Lu, BS, Philadelphia, PA; Aarti Agarwal, MD, Philadelphia, PA; Alekya Bheemreddy, BS, Philadelphia, PA; Arjun Ashok, MS, Philadelphia, PA; Eric Barbarite, MD, Philadelphia, PA; Ryan Heffelfinger, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, participants should be able to understand the effects of surgical (selective denervation) and nonsurgical (chemodenervation and facial physical therapy (PT)) interventions on quality of life for the treatment of patients with facial synkinesis.

Objectives: Post-paralytic facial synkinesis is associated with significant patient morbidity and reduced quality of life (QOL). The objective of this study is to examine the effect of surgical (selective denervation) and nonsurgical (chemodenervation and facial PT) interventions on QOL in patients with facial synkinesis. **Study Design:** Retrospective cohort study. **Methods:** Retrospective review of patients diagnosed with facial synkinesis at an academic medical center between January 2015 and July 2022. Data on patient demographics, chemodenervation regimen, facial PT and operative techniques were reviewed. Patient QOL was measured using the Sunnybrook Facial Grading Scale (SFGS). **Results:** 29 patients were included in the study. 20 patients received nonsurgical intervention (mean age = 48.6 years), and 9 patients underwent selective neurolysis (mean age: 50.2 years). Patients who received selective denervation as primary treatment had an average increase in SFGS of 14.8 (SD:10.3). Patients who received chemodenervation and facial PT had an average increase in SFGS of 12.5 (SD:14.2). There was no significant difference in change of SFGS between surgical and nonsurgical interventions ($p=0.69$). Nonsurgical patients had on average 5.25 (SD:3.06) PT sessions and 51.6 (SD:21.6) units of Botox per session. There was no correlation between number of nerve branches taken and SFGS score ($R^2=0.0108$; $p=0.64$). **Conclusions:** Improvement in patient QOL was achieved with both surgical and nonsurgical interventions for patients with facial synkinesis. No significant difference was found between interventions. This information may be used to counsel patients on treatment options.

42. WITHDRAWN - Extensive Pyoderma Gangrenosum of the Face: A Case Report and Review of the Literature

Adam C. McCann, MD, Cincinnati, OH; Susie Min, BS, Cincinnati, OH; Megan Jiang, BS, Cincinnati, OH; Isabelle Gengler, MD, Cincinnati, OH; Brentley Lindsey, MD, Cincinnati, OH; Tsung-Yen Hsieh, MD, Cincinnati, OH

43. Bovine Dermal Matrix (Integra) for Reconstruction Head and Neck Defects Prior to Radiotherapy: A Retrospective Series and Systematic Review of the Literature

Ade Obayemi, MD, Syracuse, NY; Adam Hatala, BS, Syracuse, NY (Presenter); Mallory Rowley, BS, Syracuse, NY; Ethan Fung, BS, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that Integra has long term durability following the effects of radiotherapy.

Objectives: Prior studies have suggested possible adverse effects of prior radio-

therapy on likelihood of graft take, citing as low as 50% in some reports. Although there are preliminary studies suggesting the long term durability of Integra placement prior to adjuvant radiotherapy, there are limited studies thoroughly describing the complication profile in this unique group of patients -- including hematoma/seroma collection, infection, poor graft take, contour irregularities, premature silicone separation, and color mismatch after skin grafting. The goal of this consecutive case series will be to examine the percent graft take and secondary complication rates amongst patients receiving Integra for scalp and forehead reconstruction prior to adjuvant radiotherapy over a 10 year period from a tertiary medical center. A systematic review will be conducted to further elucidate the utility of Integra prior to radiotherapy and to determine wound complication rates across the current literature. Study Design: Retrospective series and systematic review. Methods: Inclusion criteria include both male/female patients of any age requiring head and neck reconstruction for full thickness soft tissue defects followed by radiotherapy treated with Integra skin substitute. Exclusion criteria include reconstruction site other than scalp/forehead, animal studies, studies with insufficient information to extract data, partial thickness defects, or patients who did not receive adjuvant radiotherapy. The retrospective case series will be performed utilizing clinical data available at a tertiary urban medical center. Results: 46 patient charts were reviewed for patients who received Integra based forehead/scalp reconstruction for ablative oncologic defects between 2012-2022. The average age was 71 + 14 years, 36/46 patients were male, and 40/46 patients identified as white. The average defect size was 29.3 + 25.8 cm² and the most common reconstructive site was scalp (n=20) followed by forehead (n=5). 5/46 patients developed incomplete graft take or primary reconstruction; 3/5 of these patients had received prior radiotherapy. There was a total of 5/46 (11%) of patients who received adjuvant radiation. 2/5 patients who received adjuvant radiation developed seromas within the first postoperative visit. There were no incidences of incomplete graft take either prior to or during radiotherapy for any patient who received adjuvant treatment. Further national data is pending and will be completed before submission. Conclusions: Although prior radiotherapy may be a predictor of unsuccessful Integra graft take, there was no incidence of incomplete graft take among patients before or after adjuvant radiotherapy. Secondary complications such as hematoma, seroma, infection, and contour mismatch were also comparable between radiotherapy and non-radiotherapy patients in this series. Further national data will be analyzed and compared with this preliminary conclusion.

44. **Outcomes in Free Tissue Transfer Utilizing Superficial Temporal Vessels - A Single Institution Review**

Edgar Ochoa, MD, San Francisco, CA; Daniel Knott, MD, San Francisco, CA; Rahul Seth, MD, San Francisco, CA; Andrea Park, MD, San Francisco, CA; Chase Heaton, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe rates of complications associated with free tissue transfer utilizing superficial temporal vessels.

Objectives: We aim to describe surgical outcomes in head and neck reconstruction following free tissue transfer with anastomosis to superficial temporal vessels. Study Design: Retrospective review. Methods: We queried a tertiary academic medical center's free tissue transfer database for patients in which free tissue transfer with anastomosis to the superficial temporal vessels was performed from 2011 to 2022. Patient characteristics, intraoperative variables and postoperative

outcomes were collected and described. Results: In total, 74 patient cases were identified. A majority of patients underwent free tissue transfer reconstructions for scalp defects (52/74, 70.3%) utilizing an anterolateral thigh free flap (49/74, 66.2%). OR takeback rate during initial hospitalization was 4.1% (3/74), partial flap failure occurred in 9.5% (7/74) of cases, and complete flap failure occurred in 5.4% (4/74) of cases. Mean time to complete flap failure was 6.0 days (range: 2-12 days). Complete flap failures were most commonly associated with venous congestion and thrombosis. Notably, 2 of the 4 complete flap failure events occurred after discharge following an uncomplicated inpatient postoperative course. Conclusions: Overall success rates among free tissue transfers with anastomosis to the superficial temporal vessels are high. Delayed partial or complete flap failure may occur in free flaps when utilizing superficial temporal vessels.

45. **The Use of Intraoperative Ultrasound for the Design of Anterolateral Thigh (ALT) Free Flaps**

Isabel Park, MA, Washington, DC; Timothy Shaver, MD, Washington, DC; Farris Jaamour, MPH, Washington, DC; Esther Lee, MD, Washington, DC; Punam Thakkar, MD, Washington, DC; Arjun Joshi, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand a novel technique in the use of intraoperative ultrasound to more accurately design the initial incision of an anterolateral thigh (ALT) flap.

Objectives: Anterolateral thigh (ALT) flaps are a workhorse in reconstructive surgery due to their low donor site morbidity and good cosmetic outcomes. Currently, standard practice in designing ALT flaps is to identify anatomic landmarks in order to approximate the location of cutaneous perforators. This approximation can inevitably lead to placing the initial incision too medial or too lateral, leading to consequences that could affect the closure of the donor site or the viability of the free flap, respectively. We aim to describe a novel technique that aids in the initial design of the ALT flap by using intraoperative ultrasound to identify critical landmarks, allowing for the more accurate placement of the medial incision. Study Design: Case series/clinical technique. Methods: Patients who underwent an ALT free flap from 8/1/2020 - 8/1/2022 were included in our study. Prior to prepping and draping a variable frequency ultrasound probe was used to identify and mark the intermuscular septum between the vastus lateralis and rectus femoris, as well as relevant thigh anatomy. Harvesting of the ALT flap was then carried out in standard fashion. Results: 17 patients underwent ALT flap reconstruction of the head and neck within the aforementioned time period. Intraoperative ultrasound time averaged 6 minutes. No complications were encountered. Average time from incision to pedicle identification was 7 minutes. All flaps were transferred successfully. Two patients had failure postoperatively, both due to arterial thrombosis. Conclusions: The use of intraoperative ultrasound for the design of ALT flaps has been shown to be effective while requiring very little intraoperative time.

46. **The Palatal Island Flap in Oral Cavity Reconstruction: A Case Report**

Allison A. Slijepcevic, MD, Portland, OR; Farshid Taghizadeh, MD, Portland, OR (Presenter); Jonathon Chodroff, MD DDS, Portland, OR; Maddison E. Colcord, MD, Portland, OR; Peter F. James, BA, Portland,

OR; Mark K. Wax, MD, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the role of palatal island flap in reconstruction of the medium size posterior oral cavity defects.

Objectives: The hard palate provides a source of tissue for small defects in the retromolar trigone and tonsillar areas. We describe the use of this overlooked flap in a series of patients utilizing one case as an example. **Study Design:** Retrospective. **Methods:** Retrospective chart review of a reconstructive database from 1991-2021 to find palatal island flaps and their outcomes with description of one example case. **Results:** 14 palatal island flaps were used for reconstruction of the retromolar trigone or tonsil. Overall, 10 flaps were in nonradiated patients and healed well. 4 flaps were in radiated patients and had prolonged poor healing. A represented case was a 68 year old female with a history of SCCA requiring marginal mandibulectomy and radial forearm free flap that required multiple revisions and ultimately did not survive. A palatal flap was used for secondary reconstruction. First, a portion of the buccal fat pad lined the retromolar defect to provide tissue depth. A left palatal island flap was incised around the anterior and lateral circumference of the left hard palate, and mucoperiosteal tissue was elevated. The flap was pedicled posteriorly on the greater palatine vessels at the junction of the hard and soft palate. Transposition of the flap into the retromolar trigone provided full defect coverage. **Conclusions:** The palatal island flap can reconstruct medium defects of the posterior oral cavity with minimal donor site morbidity, while preserving free flap donor sites for anticipated future reconstructions. However, it should be avoided in patients with a history of radiation therapy.

47. **Complications Associated with Facial Implants: A MAUDE Database Analysis**

Lindsey Stephen, BS, Bronx, NY; Zev Hirt, BA, New York, NY; Christina Fang, MD, Bronx, NY; Andrew Lee, MD, Bronx, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the most commonly reported adverse events related to facial implants.

Objectives: Facial implants provide a way to enhance aesthetics and have increasingly become more popular. However, the most frequently occurring complications have not been reported in aggregate. The objective of this study was to analyze adverse events related to facial implants. **Study Design:** Retrospective cross-sectional analysis. **Methods:** The MAUDE database (Manufacturer and User Facility Device Experience) was queried for reports on adverse events involving facial implants between 2012-2022. Reported events were abstracted for year, type of complication, type of implant, and whether the implant needed to be removed. **Results:** There were 124 adverse events found in 82 reports. 82 complications were patient related (66.1 percent), 35 were device related (28.2 percent), and 5 were packaging related (4.0 percent). The most common device related complications were device fracture during implantation (31.4 percent), implant displacement (22.9 percent), and extrusion (14.3 percent). The most common patient related complications were infections (40.2 percent), pain (13.4 percent), and edema or swelling (9.8 percent). Implants required removal in 71 percent of 82 reports. Cheek implants had the largest number of complications at a total of 43. **Conclusions:** Infection, pain, device fracture during implantation, and implant displacement were

the most frequently reported adverse events associated with facial implants. It is important for surgeons to counsel their patients on these possible complications.

48. Management of Rare Lobular Capillary Hemangioma of the Nasal Dorsum: A Case Report

Hannah Verma, BA, New York, NY; Katherine Liu, MD, New York, NY; David W. Chou, MD, New York, NY; Alfred M. Iloreta, MD, New York, NY; Mingsyang Gray, MD MPH, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the natural history of lobular capillary hemangioma of the nasal dorsum and understand the resection and reconstruction of this rare pathological entity.

Objectives: We report the unique case of a 55 year old female with lobular capillary hemangioma of the nasal dorsum. **Study Design:** Case report. **Methods:** The patient presented with a 2 month history of an enlarging painless mass on the nasal dorsum. Exam showed a 1cm mobile cystic mass at the nasal dorsum with overlying telangiectasia. Computed tomography revealed a 7 mm x 12 mm peripherally enhancing subcutaneous lesion of the nose with a 2mm underlying osseous defect at the anterior nasal bone. Magnetic resonance imaging revealed central T1 and T2 hyperintensity of the lesion. **Results:** The patient underwent excision through an open rhinoplasty approach with endoscopic assistance. The mass eroded through the nasal bones and into the skull base posteriorly. A septorhinoplasty was performed to reconstruct the defect. Surgical pathology revealed a lobular capillary hemangioma (LCH) with intratumoral hemorrhage. **Conclusions:** To our knowledge, there are only 2 other reported cases of this pathology on the nasal dorsum. Nasal LCH is rare, and usually causes epistaxis or obstruction; this patient was asymptomatic at presentation, besides cosmetic deformity. This case of LCH demonstrated both erosion of nasal bone and extension into the skull base, which is uncommon in hemangiomas of this size. Reconstruction with septorhinoplasty provided a good aesthetic outcome for the patient.

49. Machine Learning Models to Predict Risk of Readmission for Patients Undergoing Free Flap Reconstruction after Major Head and Neck Surgery

Stephanie Yizhu Wang, BS, Philadelphia, PA; Neel R. Sangal, MD, Philadelphia, PA; Jason A. Brant, MD, Philadelphia, PA; Robert M. Brody, MD, Philadelphia, PA; Andres M. Burr, MD, Kansas City, KS; Steven B. Cannady, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how machine learning models can be applied to identify high risk free flap patients.

Objectives: This study aimed to develop predictive machine learning (ML) models to predict thirty day readmission for patients undergoing free flap reconstruction (FFR) of major head and neck (H&N) oncologic surgery. **Study Design:** Nationwide retrospective cohort analysis. **Methods:** FFR patients of the H&N were identified based on CPT codes and extracted from the 2012-2019 NSQIP. Data from 2012-2018 was used as the training set, while 2019 data was used as validation. To predict thirty day readmission, demographic and perioperative factors were analyzed

using conventional logistic regression, random forest, and an ensemble decision tree algorithm (XGBoost). Hyperparameters were tuned and prediction accuracy, area under the curve (AUC), and sensitivity were compared. Results: Out of the 4,336 free flap patients, 819 (18.9%) were readmitted within thirty days. Our logistic regression algorithm had 76% accuracy and 64% sensitivity on the test set with an AUC of 0.72. The RF algorithm had 85% accuracy and an AUC of 0.624, but poor sensitivity. The XGBoost algorithm had 70% accuracy and 75% sensitivity with an AUC of 0.80. Factors with the highest feature importance in the XGBoost readmission models were postoperative factors including increased length of stay (model gain = 97.0), sepsis (88.4), wound disruption (62.3), deep or organ surgical site infection (44.8; 26.2), and pneumonia (41.8). Conclusions: This study developed ML models that help predict risk of readmission of patients undergoing FFR. We found that XGBoost models had the largest AUC and sensitivity, suggesting the strongest ability to distinguish this risk.

50. Fibula Free Flap Reconstruction of Cervical Spine Defect following Oncologic Destruction and Resection

Sara Yang, MD, Portland, OR; Maddie Colcord, MD, Portland, OR; Zoey Morton, BS, Charleston, SC; James Wright, MD, Portland, OR; Mark K. Wax, MD FACS, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants should be able to understand an option for anterior cervical spine reconstruction following oncologic destruction.

Objectives: To describe rare utilization of the fibula free flap (FFF) for reconstruction of cervical spine defect following destruction of the anterior native vertebral structure by an oncologic pathology. Study Design: Case report. Methods: Patient was identified by the senior author. Hospital course and imaging were reviewed. Results: 79 year old male presented to an outside hospital with right hemibody weakness. Imaging workup revealed an expansile and destructive lesion spanning between the second and the sixth cervical (C2-6) vertebral bodies. He was transferred to our tertiary care facility where he underwent open biopsy for tissue diagnosis. Postoperatively, he developed new onset quadriplegia requiring urgent decompressive laminectomies of C3-6 along with posterior instrumentation between the occiput and second thoracic vertebra to stabilize the cervical spine. Pathology revealed a plasmocytoma. Given the persistent neurologic deficits and concern for posterior instrumentation failure due to the poor bone quality from tumor destruction, complete resection of the tumor was pursued. A left fibula free flap was used to reconstruct the complete anterior cervical spine defect and stabilize the vertebral column. Neurologic function was noted to improve following tumor resection and stabilization. Conclusions: Fibula free flap reconstruction of cervical spine defects has been rarely described in the literature. This case demonstrates that it is possible to reconstruct the anterior cervical spine with a vascularized bone graft with excellent strength.

General

51. Development of a Multi-Institutional Match Webinar to Improve Medical Students' Preparedness for the Otolaryngology Match

Mohamad M. Almasri, BS MBA, Washington, DC; Nadia L. Samaha, BS, Washington, DC (Presenter); Amir A. Hakimi, MD, Washington, DC; Suma Alzouhayli, BS, Detroit, MI; Phillip Q. Richards, BS, Boston, MA;

Shannon Sturgeon De La Via, BS, Parker, CO; Sonya Malekzadeh, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of a match webinar on improving medical students' preparedness for applying into otolaryngology-head and neck surgery (OHNS).

Objectives: To describe the impact of a match webinar on improving medical students' preparedness for applying into otolaryngology-head and neck surgery (OHNS). **Study Design:** Survey study. **Methods:** A panel of four recently matched OHNS residents and a program director shared their insight on a successful match into OHNS through an 85 minute long multi-institutional webinar. Data were collected from students who attended the webinar through anonymous pre and post-webinar surveys. Participants' self-reported understanding of the match process was assessed using a five point Likert scale for 7 categories. Objective knowledge of the match process was assessed through multiple choice questions. Means and standard deviations were analyzed and compared using the Walch t-test. **Results:** A total of 1,001 students registered for the webinar among which 480 (48%) completed the pre-webinar survey. 147 students (15%) attended the live event, among which 81 (55%) completed the post-webinar survey. Post-webinar analysis showed significant increases average self-reported confidence among students in categories including extracurricular activities (3.4 vs. 3.9, $p < 0.01$), research (3.6 vs. 4.4, $p < 0.01$), applying to away rotations (3.2 vs. 3.7, $p < 0.01$), personal statement and ERAS application (3.1 vs. 3.6, $p < 0.01$), requesting letters of recommendation (3.3 vs 3.9, $p < 0.01$), preparing for interviews (3.2 vs. 3.7, $p < 0.01$), and preparing a rank list (3.1 vs. 3.9, $p < 0.01$). Knowledge of OHNS residency and match statistics (number of applicants, match rate, average scores, research, extracurriculars) significantly increased after the webinar as well ($p < 0.005$). **Conclusions:** A post-match webinar significantly increased medical students' knowledge and preparedness for the OHNS match process.

52. **Evaluating the Twitter Conversation on Craniopharyngioma: Patient, Physician, and Public Perspectives**

Lorena M. Ayoub, BS, Burlington, VT; Joel S. Feier, BA, Burlington, VT; Kenny Nguyen, BS, Burlington, VT; Emmett E. Whitaker, MD, Burlington, VT; Mirabelle Sajisevi, MD, Burlington, VT

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how Twitter is used to share information about craniopharyngiomas, an extremely rare pediatric tumor.

Objectives: To characterize how physicians, patients, and others are using Twitter to discuss their experiences treating, living with, and learning about craniopharyngioma. **Study Design:** Descriptive observational study. **Methods:** A custom Python script was developed to obtain all English language original tweets that included the phrase "craniopharyngioma" from January 2016 through December 2021. The script was then used to identify study relevant tweets from Twitter's academic research database. Thematic analysis based on grounded theory was used to categorize tweets according to account type (e.g., patient, family, physician, or "other") that created the post and the content of the tweets. Further analysis was performed to subcategorize tweets by account type. **Results:** We identified a total of 846 tweets that included the phrase "craniopharyngioma" within our study's timeframe,

from which 912 total qualitative references were generated. Most posts were from “other” accounts, defined as neither the patient/family nor physicians tweeting (53.29%), followed by physicians (31.25%), and patient/family (15.46%). “Other” accounts included research organizations, hospital twitter accounts, or sources unidentifiable by author description. Posts from patient/family accounts primarily discussed perspectives of life with craniopharyngioma (29.08%) and extended requests for financial assistance (11.35%). Physician posts mostly discussed surgical approaches and technique (59.65%) followed by direct communication between physicians regarding difficult cases or diagnostic nuances (28.07%). Other accounts most often tweeted about advances in craniopharyngioma research (65.43%). Conclusions: Our study suggests that Twitter can be a rich source of information about rare diseases, including craniopharyngioma. Twitter may be an untapped resource to better understand patient perspectives, share knowledge among specialists, and raise awareness among the public.

53. **Teaching Curricula for Otolaryngology Residents**

Patrick Barba, BA, La Jolla, CA; Charley Coffey, MD, San Diego, CA;
Deborah Watson, MD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the state of dedicated teaching curricula in otolaryngology residency programs. They should also be able note program directors' and residents' attitudes towards learning how to be more effective educators. This study's objective is to explore the attitudes and approaches to teaching otolaryngology residents to be more effective educators.

Objectives: This study's objective is to explore the attitudes and approaches to teaching otolaryngology residents to be more effective educators. **Study Design:** Cross-sectional nationwide surveys sent via email. **Methods:** Two separate surveys were sent to 115 otolaryngology programs in the United States. One survey explored the program directors' views and approaches to teaching their residents how to be more effective educators. A second survey was included for program directors to distribute that was tailored to residents' views on the same topic. **Results:** The survey targeting program directors generated thirty-five responses (response rate 31%) while the survey directed towards residents had 67 responses (response rate 49%). Of program directors, 31 (89%) thought teaching was a critical part of a resident's role but only 8 (23%) had an established program focused on residents' teaching abilities. The most common barriers noted were time and funding constraints. Similarly, of resident responses, 56 (84%) thought teaching was a very important part of their role as residents. Older residents (PGY4 or greater) reported feeling more prepared to teach as compared to younger residents (PGY1-3). Twelve residents (18%) reported a dedicated curriculum within their program, and 85% of remaining respondents reported moderate to extreme interest in the establishment of a teaching curriculum. **Conclusions:** There are limited established programs that focus on teaching residents to be more effective educators. Though there is interest from both program directors and residents, limitations like time, funding, and lack of a standardized course have checked its widespread adoption.

54. **Quality and Reliability of Ear Cleaning Content on Social Media**

Alexander Chern, MD, New York, NY; Elliot Morse, MD MHS, New York, NY; Hayley Born, MD MS, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the quality and reliability of medical information on social media.

Objectives: Patients often utilize the internet and social media for medical advice. The study objectives were to evaluate quality and reliability of ear cleaning videos as patient education material on a popular social media platform. **Study Design:** Cross-sectional analysis. **Methods:** The terms “ear cleaning” and “ear-wax removal” were searched on TikTok in July 2022. The first 50 videos for each query were included. Inclusion criteria included videos featuring ear cleaning. Non-English language, non-human, and duplicates were excluded. Content was evaluated by two independent researchers using validated health information instruments--modified DISCERN and Global Quality Scale (GQS). Higher ratings corresponded with greater reliability and quality, respectively. **Results:** Of the 100 videos assessed, 83 met inclusion criteria. Mean video length was 47.9 seconds (range 7-180 seconds). Mean number of views per video was 1.78 million. 41.0% of posts were created by clinicians (9.6% otolaryngologists, 28.9% audiologists, and 2.4% other clinicians). 59.0% were created by non-clinicians (42.2% individual users, 8.4% companies, and 8.4% unknown). Compared non-clinician accounts, posts by clinician accounts had significantly higher quality (mean clinician GQS 2.2 vs. non-clinician GQS 1.5; $p<0.01$) and reliability (mean clinician DISCERN 1.3 vs. non-clinician DISCERN 0.8; $p=0.01$). **Conclusions:** The general TikTok consumer is more likely to encounter an ear cleaning video created by a non-clinician than by a clinician. Although clinician posts have higher quality and reliability than non-clinician posts, most videos had poor quality and reliability. Given its heavy consumption by the public, clinicians may consider better utilizing social media as a patient resource.

55. **Effect of Weekend Admission Status on Peritonsillar Abscess Outcomes: A National Analysis**

Aatin K. Dhanda, BA, Newark, NJ; Rushi Patel, BA, Newark, NJ; Christopher C. Tseng, MD, Hershey, PA; Mehdi Lemdani, BA, Newark, NJ; Boris Pashover, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role that weekend admission status may play in peritonsillar abscess outcomes.

Objectives: A “weekend effect” has been described as differences in outcomes for patients admitted on weekends. In this analysis we seek to determine the effect of weekend admission for peritonsillar abscess patients. **Study Design:** Retrospective cohort. **Methods:** The National Inpatient Sample (NIS) was used to identify 9,869 patients undergoing surgical treatment for peritonsillar abscess the day of hospital admission from 2003-2014. Patients with parapharyngeal and retropharyngeal abscess were excluded. Variables included patient and hospital demographics, and admissions were assessed by weekend or weekday admission status. Univariate analyses were performed. **Results:** 9869 patients were identified, with 7210 (73.1%) weekday admissions and 2,659 (26.9%) weekend admissions. Most admissions were classified as either emergency or urgent (weekday: 59%, weekday: 62.1%). 6 patients (0.06%) died during hospitalization overall, 2 following weekday admission and 4 following weekend admission. Kaplan-Meier analysis demonstrated better overall survival for weekday patients ($p<0.05$). Multivariate survival analysis was not performed due to low mortality sample size. No

significant difference was found for length of stay (LOS), or total hospital charges between weekday or weekend admission. Most patients (99.4%) were likely to be discharged to home or short term care, with few patients being discharged to long term care (0.46%) or dying during hospitalization (0.06%). No significant difference in discharge disposition was found stratifying for weekend admission. Conclusions: Our analysis demonstrates that surgically treated peritonsillar abscess requiring inpatient admission holds an excellent prognosis for patients admitted on weekdays or weekends. Additionally, outcomes including LOS, charges, and disposition were not significantly different based on weekend admission status.

56. **Management of Facial Artery Pseudoaneurysm following Dental Extraction**

Lane Bradley Donaldson, MD, Detroit, MI; Christie Morgan, MD, Detroit, MI; Benjamin Barbetta, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the risks associated with dental extractions, diagnose complications such as an aneurysm or pseudoaneurysm, and know the treatment algorithm for the subsequent complications.

Objectives: The branches of the external carotid artery are typically protected from injury by a buffer of soft tissue and/or bone. However, as branches approach the tissue surface to cross bone, they become more susceptible to injury. The most commonly affected branches are the facial artery, superficial temporal artery, and terminal branches of the internal maxillary artery. Arterial vascular injury following dental extractions is a rare complication but can be associated with significant morbidity and mortality. One such injury is the development of a pseudoaneurysm, which is the result of leakage of blood through a disrupted vessel wall into adjacent tissue creating a persistent communication. We present the case of postoperative inferior labial artery pseudoaneurysm following extraction of the third mandibular molar. Objectives are to understand the risks and complications associated with dental extractions, know how to properly diagnose potential complications, and to understand their treatment algorithms. Study Design: Case report. Methods: Case report. Results: Case report. Conclusions: Traumatic pseudoaneurysm of the facial artery and its branches is a rare but known complication following extraction of third mandibular molars. Its presentation can masquerade as an infection and if not treated can potentially lead to life threatening hemorrhage. CTA is an effective imaging modality to diagnose the condition, and selective angiography with embolization represents a viable and effective treatment alternative to surgery.

57. **Risk Stratified Venous Thromboembolism Prophylaxis in Otolaryngologic Patients Using Caprini Assessment: Practice Patterns and Opportunities for Improvement**

Michael Edwards, MD, Jacksonville, FL; Amy L. Rutt, DO FACS, Jacksonville, FL (Presenter); John Casler, MD, Jacksonville, FL; Aaron Spaulding, PhD, Jacksonville, FL; Diyya Muraleedharan, MBBS, Jacksonville, FL; Emily Brennan, MPH, Jacksonville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand venous thromboembolism (VTE) in otolaryngology (ORL) cases is low but can cause significant morbidity and mortality for in-hospital and post-discharge. Participants should be able to determine the utilization of

Caprini risk stratified VTE prophylaxis and impact on VTE and bleeding outcomes in patients after (ORL) surgeries.

Objectives: This study aimed to determine the utilization of Caprini risk stratified VTE prophylaxis and impact on VTE and bleeding outcomes in patients after otolaryngologic (ORL) surgeries in an academic hospital system. **Study Design:** This is a retrospective cohort study of elective inpatient otolaryngologic surgeries performed between 2016 and 2021. Data was obtained from a large academic health system's electronic medical records. All inpatient ORL elective surgeries between these dates were identified. **Methods:** The primary dependent variable was risk stratified VTE prophylaxis utilization (appropriate prophylaxis). Patients' risk of experiencing postoperative was identified by retrospective calculation of Caprini score. As secondary measures, inpatient, 30 and 90 day deep vein thrombosis (DVT), pulmonary embolism (PE), and venous thromboembolism (VTE) events were determined using ICD-10 codes. Further, bleeding episodes before discharge and within 30 and 90 days of discharge were evaluated. Logistic regression models were used to determine predictors of receiving appropriate prophylaxis, and postoperative VTE or bleeding. R statistical software was utilized for statistical analyses and p value < 0.05 was considered significant. **Results:** Inpatient postoperative PE (0% vs.45%, p<0.005) and VTE (0.2% vs. 0.73%, p0.023) were lower in those receiving appropriate prophylaxis. All discharge VTE events occurred in those not receiving appropriate prophylaxis. Inpatient (2.8% vs. 1.7%, p0.015), but not discharge bleeding rates higher in those who received appropriate prophylaxis. **Conclusions:** While Caprini VTE risk stratified prophylaxis has a positive impact in reducing inpatient postoperative PE and VTE, it still poses a chance for postoperative bleeding. Mitigation strategies should be a priority in order to use appropriate prophylaxis without the risk of bleeding.

58. **Impact of Anti-Fatigue Floor Mat on Operating Room Surgical Staff Comfort Levels in Head and Neck Surgery Cases**

Jacey Paige Elliott, BS, Oklahoma City, OK; Pawan Acharya, MS, Oklahoma City, OK; Lurdes Queimado, MD PhD, Oklahoma City, OK; Wesley Greene, MD, Oklahoma City, OK; Greg Krempl, MD, Oklahoma City, OK; Rachad Mhaweji, MD, Oklahoma City, OK

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate the benefits of utilizing anti-fatigue floor mats in the operating room during head and neck surgery cases.

Objectives: Work related musculoskeletal symptoms are common among surgeons and surgical staff and have long term implications on health and wellbeing. This study evaluates the impact of anti-fatigue floor mats on the comfort level of operating room surgical teams during head and neck surgeries lasting greater than 3 hours. **Study Design:** This study prospectively randomized major (greater than 3 hours) head and neck surgical procedures to the use or not of an anti-fatigue floor mat. Anonymous questionnaires measured the comfort levels in subjects including the surgeons, assistant surgeons, and scrub technicians. **Methods:** Subjects completed questionnaires before, immediately after, and one day after surgery. Variables collected included demographics, overall discomfort level, overall energy level, discomfort level in different body parts, number of breaks taken, time since exercise, and frequency of exercise. Analysis of variance (ANOVA) was used for data analysis. **Results:** 34 surgeries were included with n equal to 57. Participants using the anti-fatigue mats reported significantly lower increases in discomfort from

preop to immediately postop and 24 hours postop compared to participants not using the mats. Participants using the mats reported significantly lower levels of pain in the ankles, feet, knees, and shoulders immediately post-p compared to participants not using the mats. Participants using the mats reported significantly smaller increases in discomfort in their back, hips, knees, neck, and shoulders from preop to postop compared to participants not using the mats. Conclusions: The use of anti-fatigue floor mats during surgery is an effective and low cost intervention to decrease the work related musculoskeletal symptoms experienced by members of the head and neck surgical team.

- 59. Hands-on Simulation Training to Improve Effective Responses to Otolaryngologic Emergencies for Early Otolaryngology Residents**
Farhoud Faraji, MD PhD, San Diego, CA; David B. Hom, MD, San Diego, CA (Presenter); Jeffrey P. Harris, MD PhD, San Diego, CA; Robert Saddawi-Konefka, MD PhD, San Diego, CA; Charles Coffey, MD, San Diego, CA; Ryan Orosco, MD, San Diego, CA; Deborah Watson, MD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) recognize the educational impact of hands-on simulation training with emergent otolaryngology procedures for early residents; 2) appreciate what emergent otolaryngology procedures give the most anxiety and self-perception of competency to early residents and determine if a boot camp course can reduce this anxiety and improve confidence; and 3) determine if the self-perception of knowledge, skill and behavior is retained after attending such a boot camp course over time.

Objectives: A full day intensive simulation based hands-on course with special emphasis on procedural techniques, clinical reasoning, and communication skills was developed to improve preparedness for first year residents (interns) in otolaryngology-head and neck surgery (OHNS) for managing otolaryngologic emergencies. Study Design: Pre and post boot camp metric Likert scale survey. Methods: Interns and faculty from nine OHNS residency programs in the United States participated in this boot camp for 2 consecutive years. Pre and post boot camp metric outcome measures quantifying confidence and anxiety levels to perform specific OHNS procedures were collected using a self-administered Likert scale survey and 2 months later to assess intervention durability. Results: Pre boot camp surveys reported the least anxiety and most confidence in teamwork, but the most anxiety and least confidence in manual skills for "foreign body retrieval" and "airway management" scenarios. After the simulation course, participants reported statistically significant decreases in anxiety and increases in confidence for all questions in "foreign body retrieval" and "airway management" stations. Data collected for "uncontrolled epistaxis" (served as a negative control since we had no formal teaching station) showed decreasing confidence and increasing anxiety following boot camp. Resident satisfaction of this simulation training was "outstanding" or "very good" 22 (92%) and "extremely useful" or "very useful" 23 (96%). Conclusions: Hands-on simulation instruction early in resident training can enrich the future of residency education, improve confidence, and decrease anxiety for performing emergent procedures.

- 60. Concurrent Medical Diagnoses During Drug Induced Sleep Endoscopy (DISE)**
Andrew Stephen Franklin, BS, Memphis, TN; Chad Alexander Nieri, BS,

Memphis, TN; Marion Boyd Gillespie, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the reasoning for patients undergoing a DISE; 2) identify what a DISE is; 3) understand what LPR is; 4) distinguish the concurrent findings in DISE; 5) understand the relationship between obesity and LPR.

Objectives: Determine whether drug induced sleep endoscopy (DISE) findings of laryngopharyngeal reflux (LPR) correlate with obesity and other concurrent DISE diagnoses. **Study Design:** Single center retrospective cohort study. **Methods:** Patients 18 years and older undergoing DISE by one surgeon at a tertiary care center from July 2016 to July 2022 were included. DISE findings, patient characteristics, demographics, polysomnogram(s), and Epworth Sleepiness Scale(s) were extracted. Fisher's exact test was used to compare categorical variables, and independent sample t test compared continuous variables with Cohen's d test determining the effect size. **Results:** The study included 177 patients with a mean age of 60.87 (+/- 11.54) and a BMI of 31.24 (+/- 6.21). 38 patients were LPR+, and 103 patients were obese. LPR+ patients had a significantly greater BMI than LPR- patients ($p \leq .01$) with obesity having a mild-moderate effect ($d \geq 0.40$). A subgroup analysis of non-obese patients revealed a moderate effect between LPR and lingual tonsillar hypertrophy (LTH) ($d \geq 0.60$, $p \leq .01$). Additionally, there was a significant relationship between African Americans having LPR compared to Caucasians ($p \leq .01$). There was no difference between LPR and laryngomalacia, VOTE classifications, ESS, AHI, or gender. **Conclusions:** DISE aids in the diagnosis of obstructive sleep apnea (OSA) by simulating sleep. Associated diagnoses made by this procedure show a relationship between LPR in obese patients with obesity playing a mild-moderate role. LPR shows a relationship with LTH, and African Americans were more likely to have LPR. Future studies would benefit from examining obesity with other concurrent DISE findings along with race.

61. **The Impact of Socioeconomic Status on the Initial Presentation of Thyroid Cancer: A Retrospective Cohort Study**

Brandon S. Gold, BA, New York, NY; Mathilda Alsen, MPH, New York, NY; Evan Kominsky, MD, Indianapolis, IN; Eric M. Genden, MD, New York, NY; Maaike van Gerwen, MD PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact that socioeconomic status may have in thyroid cancer aggressiveness at initial patient presentation.

Objectives: The aim of this study was to evaluate whether socioeconomic disparities exist for initial presentation of thyroid cancer. **Study Design:** Retrospective cohort study. **Methods:** All thyroid cancer patients (ICD-10 code: C73) seen within a tertiary care center in 2018 were included. Socioeconomic status (SES) was defined using 5 year 2015-2019 American Community Survey census data categorizing low SES as the lowest quartile of median household income per zip code. Additionally, high poverty was categorized as zip codes in which greater than 20% of the residents lived below the federal poverty threshold. The association between poverty/SES and pathologic indicators of thyroid cancer aggressiveness was assessed using unadjusted logistic regression models. **Results:** A total of 222 thyroid cancer patients (89.6% papillary, 3.6% medullary, and 2.7% follicular) were identified. Among these cases, the mean age at diagnosis was 53.4 years and 62.6% were female. 55.9% had private insurance, 19.9% had Medicare, and 18.0% had

Medicaid. “Low SES” accounted for 25.2% of the cohort and “high poverty” was 20.7% of patients. Of those with papillary thyroid cancer, there was a nonsignificant trend towards increased likelihood of extrathyroidal extension for those in the “high poverty” group (OR 2.10, 95% CI=0.90- 4.91. Overall, there was no association between low SES/high poverty and presence of microcarcinoma, lymph node metastasis, and lymphatic invasion. Conclusions: Low SES and poverty may increase the likelihood of more aggressive thyroid cancer at initial presentation. Larger cohort study is needed to further explore the association between SES and thyroid cancer aggressiveness and potential effects on long term outcomes.

62. Bidirectional Needs Assessment of Otolaryngology-Head and Neck Surgery Short Term Surgical Trips

Katerina J. Green, MB BCh BAO, Pittsburgh, PA; Joshua P. Wiedermann, MD, Rochester, MN; Meera B. Ganesh, BS, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the bidirectional benefits of needs assessment surveys to establish goals, expectations, and understanding of the desires and offerings of each team. Participants should also be able to adapt the presented needs assessment tool to fit their requirements for otolaryngology short term surgical trips in any global partnership.

Objectives: Completing a needs assessment is essential prior to embarking on global short term surgical trips. Needs assessments are informative and collaborative when conducted. Their implementation can benefit both the host and visiting parties by improving trip outcomes of sustainability, training, education, and research. The primary objective of this study is to report the needs of otolaryngology departments and their patients across an African country. We also aim to describe past experiences of visitors from high income countries and hosts from this African country. Study Design: Two RedCAP surveys were constructed based on the framework used in the previously published bidirectional needs assessment tool for otolaryngology. Modifications were made to this tool for more appropriate specificities to this country, as well as improvements to the needs assessment tool for data collection and analysis purposes. Methods: Survey 1 was disseminated to all otolaryngologists in this country (n=13). Survey 2 was distributed to otolaryngologists who previously completed a short term trip to this country, identified online and through personal referrals. Results: The results and conclusions of this study are currently pending survey collection prior to the scheduled short term surgical trip by our authors to this country which will take place from September 22nd of 2022. Conclusions: Anticipated conclusions will be drawn from reports of otolaryngology specialty structure in this country, availability of support staff and essential resources, their most desired training and education topics and goals for global partnerships.

63. Journal Club in Otolaryngology-Head and Neck Surgery: Current Practices across the United States

Nelson R. Gruszczynski, MD, Charlottesville, VA; Shahzeb Hasan, BS, Charlottesville, VA; Andrew Strumpf, MPH, Charlottesville, VA; Jose Mattos, MD MPH, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe common journal club practices in otolaryngology-head and neck surgery and the format changes implemented during the COVID-19 pan-

demic.

Objectives: To report journal club (JC) practices of otolaryngology-head and neck surgery (OHNS) programs across the United States and the structural changes implemented during the COVID-19 pandemic. **Study Design:** Cross-sectional survey based study from January to March 2021, sent to 120 OHNS program directors (PDs). **Methods:** The survey consisted of 23 questions regarding JC practices and how these were affected by the social restrictions implemented during the COVID-19 pandemic. **Results:** Over a third of PDs sent in responses. Half of responders reported that their JC met monthly, with 55.3% scheduled for 1 hour. Most PDs stated there is a vetting process to article selection (68.4%) and that 3 articles are reviewed, per a specific curriculum (57.9%). Prior to the pandemic, 55.3% of JCs were held solely on campus. During the pandemic, 86.8% of JCs continued through online forums. Half of the PDs reported that the online format negatively impacted JC, citing a loss of engagement, in-depth discussion, and relationship forming experience. However, a noted benefit of the format change was an increase in faculty and alumni attendance. Responders largely believed their JC is optimized (76.3%), and those reporting otherwise lacked a specific curriculum and had lower resident attendance. **Conclusions:** JC is a universally used didactic tool across OHNS programs, despite the dearth of literature on its structure and effectiveness. Having collected a list of best practices and PD opinion on novel format changes, the authors offer a checklist for programs who believe their JC could be further optimized.

64. **Analysis of Price Transparency for Inpatient Otolaryngologic Surgery among High Volume Centers**

Mahmoud Hamza, BA MPH, Boston, MA; Waqas Haque, MD, Dallas, TX; Michael Barton, BS MPH, Ann Arbor, MI; Omar Jalisi, Boston, MA; Brenna Barton, BS, Ann Arbor, MI; Scharukh Jalisi, MD MA,

Educational Objective: In an effort to facilitate price transparency (PT), the Centers for Medicare and Medicaid Services (CMS) began to legally require hospitals to publish chargemasters and a consumer shoppable display online in January 2019. Within the otolaryngology context, PT may be particularly relevant for inpatient surgeries that have historically commanded high costs. We therefore sought to examine the impact of this important health policy on the specialty as well as more broadly.

Objectives: The aim of this study is to examine the level of price variability and compliance with the Centers for Medicare and Medicaid Services (CMS) mandate to post standard charges for their hospital services among a sample of high volume hospitals for inpatient otolaryngologic procedures. **Study Design:** Cross-sectional analysis. **Methods:** 89 hospitals were randomly selected from a sample of over 700 centers. We then collected charges for a sample of otolaryngologic operations by Medicare severity (MS) diagnosis related groups (DRG) specified case severity. Pricing data were collected for the CMS required items and the ranges of prices across hospitals was calculated. **Results:** 82 of 89 (92.1%) hospitals provided a machine readable chargemaster file. Of those, 43 (52.4%) had data on at least one of the otolaryngologic DRG codes of interest. 7% of hospitals posted any pricing data for three of the codes (DRG 129, 131, 143), while the highest rate was 27% (DRG 149). The highest median total gross charge was \$206,167 (DRG 131). The widest range in cost was \$57,687 for "major head and neck procedures" (DRG 129). The lowest variation was for "dysequilibrium" at \$11,451 (DRG 149). Con-

clusions: Our results align with and build on previous findings of low compliance with the CMS rule and wide price variability, both within otolaryngology and more broadly. These findings underscore a need for greater consistency in PT, which can support patients in making more informed decisions with regard to their care. Future directions of this work include studying the long term impact of the CMS mandate and effects of additional reform.

65. Video Preparation for Surgery in Otolaryngology May Have Positive Influence on Resident Wellness

Olivia Henderson, BS, Lexington, KY; William Ruffin, DO, Lexington, KY; Marissa Schuh, MPH, Lexington, KY; Brett Comer, MD, Lexington, KY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact that viewing perioperative videos have on resident education regarding physician confidence, knowledge, and changes in anxiety levels (as surrogate markers for wellness).

Objectives: The objective was to evaluate resident physician confidence, knowledge, and changes in anxiety levels (as surrogate markers for wellness) after viewing perioperative videos. The authors hypothesize that confidence levels and instrument knowledge would increase and anxiety levels would decrease after watching the videos. Study Design: Clinical study. Methods: A 12 question pre- and post-video viewing survey was sent to 12 PGY1-4 residents for rhinology case and image guidance setup videos. Questions examined subjective and objective data on anxiety levels, instrument knowledge, and confidence. Ongoing analysis includes a qualitative interview with 4 resident physicians with aims to understand how to improve resident wellness through use of perioperative videos. Results: Preliminary results suggest 83% (n=10) of resident physicians stated preoperative and operative videos would augment their training. 91% (n=11) reported mild to severe pre-video anxiety for setting up sinus cases; chi squared testing trended toward, but did not reveal, a significant difference ($p = 0.07759$) post-video. 92% (n=11) could not put steps for prepping nose in correct order pre-video; chi squared testing revealed improved scores after watching the videos ($p = 0.02474$). Qualitative evaluation is currently ongoing. Conclusions: Residents experience anxiety when preparing for operative cases. Residents subjectively felt perioperative video viewing would improve confidence and anxiety. Perioperative video viewing significantly improved knowledge of nasal preparation. Preliminary trends suggest the potential for statistically significant improvement in other areas but limited statistical significance may be due to current low sample size.

66. The Effect of Telehealth on the Workup and Treatment of Nasal Septal Deviation

Jacob Edward Hoerter, MD, Oakland, CA; Peter Michele Debbaneh, MD, Oakland, CA; Kalena Liu, BA, Oakland, CA; Swapnil Shah, BA, Oakland, CA; Miranda Weintraub, PhD, Oakland, CA; Nancy Jiang, MD, Oakland, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to assess the differences or lack thereof in the timeline to treatment, imaging and prescribing practices, and surgical decision making in patients initially triaged by in-person visits compared to those seen virtually by telemedicine (video or telephone) for nasal septal deviation (NSD).

Objectives: To assess differences in total visits and workup for patients undergoing septoplasty initially seen by telemedicine versus in-person. **Study Design:** Cross-sectional. **Methods:** Chart review was performed for patients undergoing septoplasty (January 2021 - May 2022). Cohorts were generated based on initial visit (telemedicine or in-person). Dependent variables were compared; two sample t test was performed to determine the difference in number of preoperative visits (primary outcome). Chi square test was performed to determine the difference in the proportion of patients with imaging, labs, or ancillary referrals ordered preoperatively (categorical data). **Results:** Study subjects (N=202) were categorized based on type of initial visit: in-person visit (121, 59.9%) versus telemedicine (81, 40.1%). Virtual visits were by video (67) or telephone (14). The two cohorts were similar in demographics (age 38.7 + 14.1 telemedicine vs 38.5 + 15.1 in-person, % female 34.57 vs 25.62). The telemedicine cohort had a statistically significant higher number of preoperative visits (3.19, 95% CI 2.8 - 3.6) compared to in-person (2.68, 95% CI 2.3 - 3.0, $p = 0.032$). There was no statistically significant difference in patients who underwent preoperative imaging (29.63% virtual vs. 26.45% in-person, $p = 0.620$), laboratory testing (69.13% virtual, vs 78.51%, $p = 0.133$), or referrals (23.46% virtual, vs 17.36%, $p = 0.289$). **Conclusions:** Among patients undergoing septoplasty, those initially evaluated by telemedicine are more likely to have more preoperative visits than those initially evaluated in-person. There is no evidence to suggest an increase in the number of labs, imaging, or referrals ordered. Further investigation is warranted to assess for this effect on other diagnoses.

67. Variations in Nasal Bone Fracture Trends during the COVID-19 Pandemic

Jacob E. Hoerter, MD, Oakland, CA; Pauline P. Huynh, MD, Oakland, CA; Louis McKinnon, BA, Berkeley, CA; Jonathan Liang, MD, Oakland, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify differences in nasal bone fracture (NBF) trends between varying causes and demographics in the pre-COVID and COVID eras that presented to the emergency department.

Objectives: Nasal bone fractures (NBF) are the most common type of facial fracture. We aim to assess differences in demographics, incidence, and cause of NBF between pre-COVID19 and COVID19 eras. **Study Design:** Database query. **Methods:** The National Electronic Injury Surveillance System (NEISS) database was queried for adult NBF. We identified demographic and case variables (age, sex, race, location, disposition, product) between 2012-2021, and assessed from differences between the 2012-2019 period and 2020-2021 period. **Results:** There was a total of 523,259 (95% CI, 445,082-601,436) reported ED treated adult NBFs from 2012-2021. There was a greater incidence of NBF during COVID19, with an average of 61,621 annual NBF cases (95% CI, 61,572-61,669) during 2020-2021 compared to 50,773 cases annually (95% CI, 50,195-51,351) during 2012-2019 ($p < 0.01$, Wald test). The mean age was older during 2020-2021 (59.02 years; 95% CI 57.35 - 60.70) than during 2012-2019 (55.10; 95% CI 53.35 - 56.86). There were no significant changes in NBF incidence among racial groups, except for patients identifying as "other" ($p = 0.037$, Wald test). A smaller portion of patients with NBF during 2020-2021 were discharged following ED evaluation (79.46%; 95% CI 74.45%-83.70%) compared with during 2012-2019 (84.41%; 95% CI 82.36%-

86.28%) ($p=.049$, Wald test). During 2020-2021, there was a small proportion of sports associated NBFs such as basketball (2.36% [95% CI 1.71-3.27%] vs 5.21% [95% CI 4.20-6.45%], $p < 0.01$) and baseball (1.18% [95% CI 0.82-1.69%] vs 2.22% [95% CI 1.80-2.74%], $p < 0.01$). There were no significant changes in the proportion of fall associated NBFs between 2012-2019 and 2020-2021. Conclusions: A greater incidence of traumatic NBFs were noted since the start of the COVID19 pandemic without significant changes within specific sex or racial groups, possibly reflecting a broad change in activity. NBFs during COVID19 were less likely to be related to sports related activities and were less likely to be discharged from the ED, suggesting changes in behavioral etiologies and severity of NSF during these unprecedented times.

68. **Social Media in Otorhinolaryngology: A Scoping Review**

Alice Elaine Huang, MD, Palo Alto, CA; Erik Chan, BS, Palo Alto, CA; Christopher Stave, MLS, Palo Alto, CA; Zara M. Patel, MD, Palo Alto, CA; Peter H. Hwang, MD, Palo Alto, CA; Michael T. Chang, MD, Palo Alto, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe trends in social media use within the field of otorhinolaryngology.

Objectives: Social media provides a versatile and increasingly popular medium for those in the medical community to engage with patients, trainees, and colleagues. The aim of this review is to analyze the growing body of literature on the use of social media in otorhinolaryngology. Study Design: Scoping review of the literature. Methods: PubMed, EMBASE, and Web of Science were searched for English language peer reviewed studies published to date (March 2022) discussing social media use in any form within otorhinolaryngology. Abstracts without accompanying manuscripts were excluded. 3 reviewers independently screened all abstracts. 2 reviewers independently read the detailed full text of articles identified from the preliminary abstract screen and extracted data of interest. Results: 171 studies were included, with 94 (54.9%) studies published between 2020-2022. 104 (60.8%) studies were conducted in the US, and 135 (78.9%) used cross-sectional or survey based methodology. Social media was most commonly employed in manuscripts pertaining to professional networking ($n=37$ [21%]), and within the subspecialties of otology ($n=38$ [22%]) and rhinology/allergy ($n=25$ [15%]). When examining social media application, Facebook was most frequently used for study recruitment ($n=23$ [13.5%]), YouTube for patient education ($n=15$ [14.6%]), and Twitter for professional networking ($n=16$ [9.4%]). Unique examples of social media utilization include patient recruitment via a large idiopathic subglottic stenosis Facebook group to assess surgical outcomes and leveraging Instagram and Twitter to interface with prospective otorhinolaryngology residents during the COVID-19 pandemic. Conclusions: Social media use within otorhinolaryngology is increasing rapidly. Social media can be utilized to enhance patient education, professional networking, recruitment for research studies, and obtaining cross-sectional data.

69. **Rate of Anosmia among Patients Taking Cardiac Medications: A 2013-2014 NHANES Cross-Sectional Study**

Patrick Ioerger, BSChE, St. Louis, MO; Jay F. Piccirillo, MD, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to identify correlations between certain medications and anosmia,

what the NHANES database is, and how it can be properly used.

Objectives: With the 2020 Covid pandemic, there is increased interest in the pathogenesis and management of anosmia. We sought to analyze the association of various demographic and clinical features with anosmia. Using the National Health and Nutrition Examination Survey database (NHANES) database, we described the relationship between anosmia and common medications. **Study Design:** Cross-sectional survey evaluating the relationship between medications and the presence of anosmia using the NHANES database. NHANES is a program of studies designed to assess the health and nutritional status of a nationally representative US population sample combining interviews, physical examinations, and periodically different objective tests. **Methods:** The 2013-2014 dataset included a smell identification test for a subset of the survey population. 8 scratch and sniff questions were asked: 2 about identification of natural gas and smoke ("hazard smells"). Rate of correct identification of hazard smells was calculated. Cross tabulations were run to describe the magnitude difference in the rate of correctly identifying hazard smells between those who did and did not take various medications. **Results:** There were 3,519 participants and 77.6% correctly identified both hazard smells. The following medications had the greatest difference: furosemide (Δ correct identification of hazard smells = -13.7%), metoprolol (-10.1%), pravastatin (-9.1%), simvastatin (7.9%), atenolol (-8.9%), amlodipine (-8.4%), and lisinopril (-5.1%). **Conclusions:** There is a clinically significant difference in ability to identify hazardous smells among adults taking and not taking certain heart failure medications. This apparent relationship warrants further investigation into whether the underlying clinical condition is associated with anosmia or if anosmia is an adverse effect of cardiac medications.

70. **Implications of COVID-19 for Long Term Airway and Swallowing Function**

Kayla Marie Jasper, MD, Shreveport, LA; Lauren Linquest, BA, Shreveport, LA; Karuna Dewan, MD, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to better treat and understand airway and swallowing outcomes of patients impacted by COVID-19.

Objectives: The acute treatment and complications of the novel COVID-19 virus has been well studied, but the implications of this novel virus for swallowing function have not been investigated. The purpose of this study was to better characterize the impact of COVID-19 on the upper aerodigestive tract function. **Study Design:** A retrospective chart review was performed from March 2020 to May 2022. **Methods:** Patients admitted to a single institution ICU with a primary diagnosis of COVID-19 were included. Vulnerable populations were excluded. Variables analyzed include age, gender, length of intubation, length of ventilation, airway interventions, use of ECMO, diet prior to, during and after hospitalization for COVID-19 infection. **Results:** Two hundred and seven patients fit inclusion criteria. There was a significant difference in discharge diet between those patients who were intubated and those who were not ($p=0.007$). 30% of patients were discharged on a different diet than their baseline with patients on a nonregular diet significantly more likely to discharge to a facility ($p=0.043$). Negative vaccine status was associated with prolonged ICU stay, prolonged duration of intubation and prolonged duration of ventilation. Intubation was significantly more likely in patients with a cardiac history ($p=0.014$), diabetes ($p=0.037$), hypercoagulable ($p=0.019$), immu-

nocompromised ($p=0.021$), seizures ($p=0.019$), dementia ($p=0.006$). Conclusions: COVID-19 continues to present novel challenges with new implications and outcomes being discovered in the second year of the pandemic. Further research is necessary to determine the most effective treatment approaches with respect to optimized speech and swallow outcomes.

71. Addressing Oral Health among Refugee Children: Best Practices and Systematic Literature Review

Nazineen Kandahari, MS, San Francisco, CA; Zainab Farzal, MD MPH, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the oral health issues and needs of refugee children; 2) describe factors that put refugee children at higher risk of developing oral disease compared to non-refugee children; 3) describe the role of otolaryngologists in promoting oral health and preventing disease among refugee children; and 4) identify areas of needed research in the oral health of refugee pediatric patients.

Objectives: Refugee children may have at risk oral health due to an extended period of adversity and deprived access to oral care. Due to the negative effects of oral disease on quality of life, a review was performed to determine best practices for addressing oral health problems among refugee children resettled in developed nations. Study Design: Systematic review. Methods: A systematic search was performed in PubMed database in accordance with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines using Medical Subject Heading (MeSH) terms: “children”, “refugee”, and “oral health”. Interventional, cohort, cross-sectional, or epidemiological studies studying children resettled in developed nations were included. Results: Of 21 included studies, 14 analyzed oral health in refugee children directly, and 7 were qualitative studies interviewing parents of refugee children. Five cross-sectional studies included clinical oral/dental exams upon arrival to the host country and found as many as 46% of refugee children had dental caries. In two studies comparing refugee children to age/sex matched children raised in developed nations, refugees had significantly worse oral health. Four studies were interventional in design and demonstrated that parental educational improved knowledge and children’s oral hygiene. Early oral screenings also led to most children receiving referrals and completing treatment. Conclusions: The refugee pediatric population is at a higher risk of oral disease than non-immigrants. Developed nations should address this health disparity with safety net features built into society. Otolaryngologists care for many conditions stemming from poor oral hygiene, and thus have a role in addition to dentists and pediatricians.

72. WITHDRAWN - Concerns Regarding Health Related Social Media Usage among Otolaryngology Patients

Sameer D. Kini, MD, Cincinnati, OH; Firas A. Houssein, BS, Cincinnati, OH; Sarah M. Adams, BS, Cincinnati, OH; Armo Derbarsegian, BS, Cincinnati, OH; Katie M. Phillips, MD, Cincinnati, OH; Ahmad R. Sedaghat, MD PhD, Cincinnati, OH

73. Complications Associated with Microdebriders in Otolaryngology Procedures from 2011-2021: A MAUDE Study

Esther Lee, DO, Washington, DC; Hari Magge, BA, Washington, DC

(Presenter); Timothy Brandon Shaver, MD, Washington, DC; Ameet Singh, MD, Washington, DC; Punam Thakkar, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the most common device malfunctions and subsequent patient injuries related to usage of microdebriders in otolaryngology procedures and be able to educate their patients on risks of microdebrider usage.

Objectives: The microdebrider is a powered surgical instrument that is widely used in the field of otolaryngology. We aim to identify the type and frequency of device malfunctions, patient complications, and subsequent interventions related to the use of microdebriders. **Study Design:** Analysis of US Food and Drug Administration's (FDA) Manufacturer and User Facility Device Experience (MAUDE) database. **Methods:** The MAUDE database was queried for reports including "microdebrider", with adverse events from 1/1/2011 - 12/31/2021. Data was extracted from reports pertaining to the use of microdebriders in head and neck surgeries. **Results:** There were 282 adverse events in 268 individual medical device reports (MDR). Although the majority of the reports did not specify the specific operation, endoscopic sinus surgery was the most commonly reported procedure (89, 33.2%). The most common cause of device malfunction was due to broken pieces, like burrs and blades (120, 48%), followed by overheating of the microdebrider motor (78, 31.2%). Of the reports which specified patient injury, the most commonly reported were unintentional tissue damage (10, 32.3%), burn (6, 19.4%), and bleeding due to arterial injury (6, 19.4%). **Conclusions:** The microdebrider has demonstrated utility within the field of otolaryngology but is not without risk of malfunction that can cause patient injury. By understanding possible risks of microdebrider usage, including tissue damage, burns, and bleeds caused by device malfunction or operator error, physicians can be better prepared to address complications and educate patients.

74. The Utility of a Narcotic Take Back Program in Outpatient Head and Neck Surgery - A Pilot Study

Daljit Mann, MD, Oklahoma City, OK; Amy Parker, BS, Oklahoma City, OK; Greg Krempl, MD, Oklahoma City, OK; Rachad Mhaweji, MD, Oklahoma City, OK

Educational Objective: At the conclusion of this presentation, the participants should be able to educate patients on the safe use of prescription opioid medication and discuss recommended methods of safe disposal of excess opioid medication.

Objectives: Patients may benefit from education on available methods for safe opioid disposal. The clinical practice guideline on opioid prescribing published by the AAO-HNS state that clinicians should recommend that patients dispose of unused opioids through take back programs. This study aims to determine the efficacy of a take back program for unused medication and assess the adequacy of pain management prescribing patterns following common head and neck surgical procedures. **Study Design:** Survey based prospective study, conducted from September 2020 through April 2021. **Methods:** Selected patients were opioid naive, aged 18-85, and underwent outpatient procedures including thyroidectomy, parathyroidectomy, neck dissection, and wide local excisions for benign and malignant diagnoses. A total of 48 patients were counseled regarding the risks of long term opioid use, alternative nonopioid medication use, and opioid take back opportuni-

ties. Patients given opioid prescriptions were surveyed at the postoperative visit to evaluate their pain management experience and asked to voluntarily return any unused opioid medications. Results: 40 patients (83.3%) reported either adequate or too much medication prescribed. Despite this, only 4 patients (8.3%) voluntarily returned unused opioids at the followup visit. The most common reasons for not returning medications included: forgot to bring, still using medication, using for sleep aid/other pain, or saving for future use. Conclusions: Although many patients state they are overprescribed narcotics, only a fraction utilize a recommended take back program. Based on the findings of this study, postoperative reminders may improve the efficacy of the program. Future efforts must focus on improving prescribing habits and identifying barriers to safe disposal of excess medication.

75. **Identifying Core Journals in Otolaryngology: The Application of Bradford's Law**

Leo L.T. Meller, BS, La Jolla, CA; Milind Vasudev, BS, Irvine, CA; Anh-Tram Bui, BS, Irvine, CA; Edward C. Kuan, MD MBA, Irvine, CA; Tjason Tjoa, MD, Irvine, CA; Yarah M. Haidar, MD, Irvine, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to list the core journals in otolaryngology, identified by application of Bradford's law.

Objectives: To characterize the core journals in the field of otolaryngology, applying Bradford's law. Study Design: Online based cross-sectional study. Methods: Using h index and impact factor (IF), the top 15 National Library of Medicine indexed otolaryngology journals were selected for analysis. The references from all articles published in these journals in one randomized quarter were compiled into a citation rank list, with the most cited journal ranked the highest. Bradford's law was applied to identify zonal distribution of journals that obey the distribution of $c:ck:ck^2$. Results: A total of 3157 journals containing 26876 articles were cited in otolaryngology literature in April-June 2019. Laryngoscope was the most cited journal containing 1762 citations. IF is significantly associated with h index for the top 10 otolaryngology journals ($P=0.032$). Three zones obeying Bradford's distribution were identified, with zone 1 containing 8 journals, zone 2 containing 37 journals, zone 3 containing 195 journals. A linear relationship between the log journal rank for zone 1-3 and cumulative number of citations was found ($R^2=0.995$). Conclusions: Eight core journals for otolaryngology were identified: Laryngoscope, Otolaryngol Head Neck Surg, Otol Neurotol, JAMA Otolaryngol Head Neck Surg, Head Neck, Eur Arch Otorhinolaryngol, Int J Pediatr Otorhinolaryngol, Ann Otol Rhinol Laryngol. In the face of rapidly evolving research and multitude of journals, the high citation density within these core journals highlights their utility in updating busy clinicians.

76. **The Top 75 Twitter Influencers in Otolaryngology - Head and Neck Surgery**

Alexis Miller, BS, Nashville, TN; Ankita Patro, MD MS, Nashville, TN; Madelyn N. Stevens, MD, Nashville, TN; David S. Haynes, MD MMHC, Nashville, TN; Michael C. Topf, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the relationship between Twitter influence and academic influence in otolaryngology.

Objectives: Social media platforms serve as a virtual podium to discuss current topics relevant to otolaryngology. With increasing academic discourse occurring in this online platform, we must examine who is influencing these discussions. While this has been performed in various medical specialties, to our knowledge this has not been examined in otolaryngology. The purpose of this study is to identify the top Twitter influencers in otolaryngology and determine if there is a relationship between Twitter influence and academic impact. **Study Design:** Cross-sectional study. **Methods:** Right Relevance program was used to identify and rank the top 75 Twitter influencers, excluding organizations, according to the search terms “otolaryngology”, “head and neck surgery”, “ear nose throat”, “rhinology”, “head and neck”, “laryngology”, “facial plastics”, “otology”. Demographic data and h-index were collected for each influencer. Correlational analysis was performed to assess the relationship between Twitter rank and geographic location, sex, subspecialty, and h-index. **Results:** Of the top 75 influencers, the majority were otolaryngologists (87%) with general otolaryngology being more common than any subspecialty. Most were female (68%) and located in the United States (61%). There was a significant relationship between Twitter rank and h-index ($p=0.006$). There was no significant relationship between Twitter rank and subspecialty, sex, or location. **Conclusions:** The majority of Twitter influencers within otolaryngology were otolaryngologists, female, and located in the United States. This study suggests that social media influence is positively associated with academic impact amongst otolaryngologists. Additional studies are needed to further define this relationship and consider its implications for evaluating the impact of academic physicians.

77. **Increasing the Use of Effect Size and Confidence Intervals when Reporting Results: An Opportunity for Improvement**

Brevin J. Miller, BA, St. Louis, MO; Jay F. Piccirillo, MD, St. Louis, MO

Educational Objective: Our objective is to encourage the use of effect size with confidence intervals in reporting results to assist in the determination of clinical significance.

Objectives: The use of P values limits the interpretation of study results. Measures of effect size describe the magnitude of a difference or strength of an association between variables. The addition of confidence intervals supports clinically meaningful conclusions. Our objective is to describe the use of P values, effect sizes, and confidence intervals in poster presentations from the 2022 Triological Society annual meeting. **Study Design:** Cross-sectional descriptive study. **Methods:** Poster presentations from the 2022 Triological Society annual meeting were accessed through the 2022 Combined Otolaryngology Spring Meeting (COSM) website. Poster presentations were excluded if they were unable to be viewed (withdrawn or not downloadable) or if the use of effect size or P value was deemed unnecessary based on the study design. **Results:** Of the 145 poster presentations listed on the 2022 COSM website, 4 were unable to be viewed, and 27 were excluded based on study design. Of the remaining 114 studies, 29 reported P value alone, 4 (3.5%) reported effect size alone, 57 reported both measures, and 24 reported neither. Of the 61 studies reporting effect size, 44 (72%) included confidence intervals, of which none were used to interpret the clinical meaning of results. **Conclusions:** Of the posters accepted for the 2022 Triological Society annual meeting, most reported P values, few reported effect size independent of P value, and most of the studies reporting effect sizes also included confidence intervals. The increased use of confidence intervals with effect size when reporting results will assist in the

determination of clinical significance.

78. **Surgical Ergonomics of Women in Otolaryngology**

Elliot Morse, MD MHS, New York, NY; Lexa Harpel, BA, New York, NY; Hayley Born, MD MS, New York, NY; Anais Rameau, MD MSc MPhil MS, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the ergonomic challenges experienced by women in otolaryngology and possible areas for improvement.

Objectives: To explore the surgical ergonomic challenges experienced by female otolaryngologists, identify specifically challenging equipment and instruments, and assess the impact of ergonomics on female otolaryngologists. **Study Design:** Qualitative study using an interpretive framework rooted in grounded theory. **Methods:** We performed semi-structured qualitative interviews of 14 female otolaryngologists from 9 institutions in various stages in training and subspecialties. Interviews were analyzed by thematic content analysis by two independent researchers with differing opinions reconciled via consensus discussion. **Results:** Inter-rater reliability was 97% and Cohen's kappa was 0.68. Main themes identified included struggling with equipment, pain while operating, time and mental burden, the importance of mentorship, and the effect of ergonomics on sense of belonging. Participants noted difficulties with microscopes, chairs, tables, and stepstools as well as difficulty with larger surgical instruments, frustration when smaller instruments were not available, and a desire for a larger spectrum of instrument sizes. Participants reported back, neck, and hand pain associated with operating. Participants noted the time and mental burden of ensuring that their operating room setup was adjusted to their size. Multiple participants noted that the feeling that their physical environment was not designed for them eroded their sense of belonging as a surgeon. They noted positive stories of mentorship and empowerment by others taking the time to help them optimize the operating setup for themselves. **Conclusions:** Female otolaryngologists face unique ergonomic challenges. As the otolaryngology workforce becomes increasingly diverse, we must address the needs of diverse physiques to avoid inadvertently disadvantaging certain groups.

79. **Imaging of a Cochlear Implant in a Portable, Low Field MRI Unit**

Christopher Cooper Munhall, BA, Charleston, SC; Donna R. Roberts, MD, Charleston, SC; Robert F. Labadie, MD PhD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate overall image quality along with image distortion and artifacts generated when scanning a cochlear implant in a conventional 3T MRI scanner in comparison with a portable, low field magnetic strength 0.064T MRI scanner.

Objectives: This study sought to evaluate cochlear implant (CI) imaging in a novel, low magnetic field MRI machine, the Hyperfine Swoop, which is portable and has significantly lower magnetic field strength (0.064 Tesla) than typical stationary units (1.5T, 3.0T). This serves as a pilot study toward imaging current CI users in this low field MRI unit. **Study Design:** Pilot study evaluating imaging characteristics of a CI in the 0.064T Hyperfine Swoop and 3T Siemens Prismafit using MRI phantom. **Methods:** An Advanced Bionics HiRes™ Ultra 3D CI was affixed to the Hyperfine MRI phantom using hot melt adhesive and self-adhering wrap. Images

were obtained in both the Hyperfine 0.064T and Siemens 3T machines, with CT scans after each to verify that the CI did not move between scans. Analysis of the images was performed to estimate artifact due to the CI. Results: Image quality with the 3T scanner was subjectively better but artifact secondary to the CI was subjectively worse. Greatest diameter of the image void (a.k.a. cookie cut) was 125mm for the 3T MRI and 86mm for the 0.064T MRI. Image void measured from surface to maximum depth was 63mm for the 3T MRI and 65mm for the 0.064T MRI. Conclusions: As expected, better images but larger image voids were seen with the stronger 3T MRI. However, portability and reduced concerns regarding MRI safety (e.g., everyday metallic objects such as glasses, keys, and cellphones can be brought close to the 0.064T magnet) may lead to use of such machines to monitor retrocochlear pathology in CI recipients.

80. **Musculoskeletal Injuries and Ergonomic Practices among Otolaryngology Residents**

Christopher C. Munhall, BA, Charleston, SC; Rachana Gudipudi, MD, Seattle, WA; Shaun A. Nguyen, MD, Charleston, SC; Lucinda A. Halstead, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate work related musculoskeletal disorders (WMSDs) among otolaryngology residents and the impacts they have on daily life and surgical training. Additionally, participants should be aware of the impact of various clinical settings on work related injury among otolaryngology residents as well as their practices and attitudes surrounding ergonomic measures.

Objectives: Surgical residents are at high risk for work related musculoskeletal disorders (WMSDs), which can impact activities of daily living (ADLs) and surgical training. We sought to assess WMSDs among current otolaryngology residents. We focused on the upper extremity given fine motor control required for microsurgical procedures and increased documentation/keyboarding requirements. This study hopes to build on previous research by evaluating WMSD characteristics and attitudes toward ergonomics among otolaryngology residents. **Study Design:** A survey was designed to assess WMSDs and ergonomic practices among otolaryngology residents. **Methods:** A web based survey incorporating the Nordic Musculoskeletal Questionnaire (NMQ) and various WMSD/ergonomics related questions was sent to otolaryngology residency programs. Summary statistics were utilized for responses. **Results:** Overall, 148 otolaryngology residents completed the survey; 70 (45%) were female, 83 (54%) male, and 1 (0.6%) non-binary. MSK symptoms were reported in the neck (77.0%), lower back (45.5%), upper back (31.8%), and wrists (30.5%) most frequently. Symptoms were deemed work related by 80% of residents, 84.7% of which were deemed operating room related. Some required treatment (14.5%) or formal evaluation (11.0%) of their injury. Injuries prevented residents from working (7.4%), operating (9.5%), and performing ADLs (27.0%). Many reported they would use ergonomic equipment (94.2%), dictation software (74.1%), and scribes (81.3%) if available. **Conclusions:** Despite increased surgical ergonomic awareness, WMSDs are still prevalent among otolaryngology residents. Nearly 1 in 9 residents required evaluation and treatment of their WMSD, and one-third reported lacking various ergonomic measures. Given high rates of WMSDs, increased support of ergonomic practices for otolaryngology trainees should be emphasized among programs.

81. **Medical School Anatomy Surgical Demonstrations Increase**

Otolaryngology Interest and Exposure

Norman Ahmad Orabi, MD, Morgantown, WV; Erica McArdle, MD, Morgantown, WV; Anna Lama, EdD, Morgantown, WV; Johnathan Castano, MD, Morgantown, WV

Educational Objective: At the conclusion of this presentation, the participants should be able to determine whether otolaryngology surgical demonstrations in a head and neck anatomy course can impact medical student exposure to and interest in otolaryngology.

Objectives: To assess whether otolaryngology surgical demonstrations in a head and neck anatomy course impacts medical student exposure to and interest in otolaryngology. **Study Design:** Pre- and post-intervention survey study. **Methods:** Otolaryngology faculty with resident assistance performed 5 mock surgical demonstrations during a routine, prosection based medical school head and neck anatomy course for preclinical students during December, 2021. Voluntary and anonymous matched pre-course and post-course surveys were distributed. The entire first year medical school cohort participated in the head and neck anatomy course and were invited to complete the surveys. Primary outcomes focused on exposure and interest in otolaryngology. Secondary outcomes assessed participation and ability to learn. Statistical analysis was performed with one sample and paired Wilcoxon signed rank tests using a Likert scale 1-5 and a level of significance of $p=0.05$. **Results:** Twenty-five students completed both surveys. Compared to pre-surveys, we observed increased exposure (2.00 vs 2.88, $p=0.004$) and career interest in otolaryngology (2.72 vs 3.32, $p=0.006$) as well as improved ability to describe both the field of otolaryngology (2.28 vs 3.28, $p=0.002$) and role of an otolaryngologist (2.48 vs 3.24, $p=0.014$). In addition, students felt otolaryngology facilitators improved clinical relevance (4.00, $p<0.001$), participation (3.72, $p<0.001$), and ability to learn head and neck anatomy (3.68, $p<0.001$) compared to the anatomy course alone. There was a strong recommendation for otolaryngology facilitators in future courses (4.04, $p<0.001$). **Conclusions:** Otolaryngology surgical demonstrations in an anatomy course was associated with increased exposure, understanding, and interest in otolaryngology and ability to learn head and neck anatomy.

82. FDA Device Approvals Over a 10 Year Period as a Surrogate Marker for Research Productivity in Otolaryngology and Other Specialties

Tyler J. Ostrowski, BS, Albany, NY; Saad Akhtar, MD, Boston, MA; Tam Ramsey, MD, Albany, NY; Melissa Mortensen, MD, Albany, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the trends in FDA device approvals over a recent 10 year period and understand these trends as one surrogate measure of research productivity in otolaryngology and other respective specialties.

Objectives: Due to the rigorous application process and data scrutinization involved, review and analysis of a prolonged period of Food and Drug Administration (FDA) processes such as premarket notification, premarket approval, and de novo medical device approvals can be used as surrogate metrics for research productivity of clinicians and the assessment of innovation in otolaryngology as a specialty. **Study Design:** Review and analysis of open database tracking original FDA device applications from 2009-2019. **Methods:** Descriptive statistics were used to analyze the data. Pearson's coefficient was used to analyze the variables. **Results:** Otolaryngology ranked 13th out of 14 specialties in the number of premarket device ap-

provals and total 510(k) clearances, and 9th out of 14 in de novo device approval in the period studied. There were four premarket devices approved: three otologic and one drug eluting sinus stent. Six de novo devices were approved during this period, five of which were otologic related. Of 449 otolaryngology related 510(k) approvals, 160 were in general otolaryngology, 135 otology related, and 98 rhinology related. Among the 160 approved general otolaryngology devices, 54 were related to bronchoscopy and biopsy, 46 to nerve monitoring or stimulation, and 30 were scopes. Conclusions: Investigation into FDA device approvals as a surrogate measure of productivity demonstrates that innovation in otolaryngology falls short to many of its medical and surgical compliments. Despite this trend and the comparatively small size of our professional community, we urge our colleagues within the field of otolaryngology to continue to improve patient care through growth and innovation of devices.

83. Otolaryngology Home Match Trends in the COVID Era: A Return to Normalcy?

Kush Panara, MD, Philadelphia, PA; Neel Sangal, MD, Philadelphia, PA; Austin Cao, BS, Philadelphia, PA; Tiffany Chao, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how trends in the otolaryngology match during the COVID-19 pandemic are changing.

Objectives: The landscape of the NRMP match process changed significantly during the COVID-19 pandemic, with virtual interviews becoming universally adopted. Recent analyses of geographic trends in the otolaryngology match have shown a significant increase in the rate of applicants matching at their home programs in 2021. These studies hypothesize that virtual interviews and limitations on away rotations have predisposed programs to choose home students. As the 2022 match employed a virtual interview format for a second year with loosened restrictions on away rotations, we evaluated whether the trend towards increasing home match rates (HMR) persisted. Study Design: Using data from the NRMP, Doximity, program specific social media, and Otomatch.com, the program applicant's matched program was compared to the applicant's home medical school. Data was verified using multiple sources. DO only programs were excluded. Methods: HMR was calculated and chi squared analysis was used to evaluate trends and statistical significance. Results: There were 1321 successfully matched students in otolaryngology from 2019-2022. There was a statistically significant increase in HMR during 2021 compared to the two prior years (21.1% vs 29.0%, $p = 0.017$). In 2022 there was a downtrend from 2021, although not statistically significant, in the HMR (29% vs 23.5%, $p = .104$). When HMR for the two years prior to COVID (2019-2020) were compared to 2022, there was no statistically significant difference (21.1% vs 23.3%, $p = 0.521$). Conclusions: In 2022 the HMR returned to pre-COVID baseline. These results can guide both programs and applications as they navigate the match process.

84. Conception and Implementation of Free Otolaryngology Homeless Clinics in Urban Areas

Evan A. Patel, MS, Chicago, IL; Swapnil V. Shah, BS, Omaha, NE; Tasher A. Losenegger, MD, Chicago, IL; Ashok A. Jagasia, MD PhD, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants

should be able to recognize common ENT related diagnoses identified within the homeless population and understand the framework related to the implementation of an innovative method of providing care to this marginalized cohort.

Objectives: To describe the integration of otolaryngology care into healthcare clinics for patients experiencing homelessness, highlight innovative solutions to reaching these communities and delivering specialized care, and assess the burden of ENT complaints in this setting. **Study Design:** Retrospective chart review. **Methods:** These novel free clinics were designed through partnership between a large academic medical center and local homeless shelters to provide multispecialty care beyond the current standard. Rooms within these shelters were staffed by physicians, audiologists, administrative personnel, and medical students. Otolaryngologists were available in-person or through telemedicine kiosks. Audiologists provided audiometric evaluations for complaints of hearing loss. Patients requiring hearing aids and/or specialty care were provided transportation vouchers to and from the closest academic center. Chart review identifying otolaryngological diagnoses was performed for patients seen in two urban clinics (January 2016 - March 2020). **Results:** 812 patient charts were evaluated with 183 ENT related diagnoses identified (22.5%). Of the ENT complaints, the most common diagnoses were rhinitis (12.6%), sensorineural hearing loss (8.74%), chronic cough (10.4%), sinusitis (12.6%), and cerumen impaction (4.92%). **Conclusions:** ENT complaints account for a substantial proportion of clinic visits in patients experiencing homelessness. When in-person care was not feasible, telemedicine effectively connected otolaryngologists with geographically distant patients. Providing audiometry and hearing aids locally substantially reduced barriers to hearing care. Travel vouchers enabled patients to visit academic centers for specialized treatment not feasible in clinic. The innovations in these clinics have helped overcome some of the barriers the homeless population faces regarding accessibility to specialty care.

85. **Healthcare Costs of Common Otolaryngologic Diagnoses**

Terral Patel, MD, Pittsburgh, PA; Manasa Melachuri, MD, Pittsburgh, PA; Jonas Johnson, MD, Pittsburgh, PA; Daniel Carmen, BS, Pittsburgh, PA; Michael Corcoran, BS, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to have an idea on the general healthcare and out of pocket costs for common otolaryngology diagnoses as well as understand the complexities and burden of healthcare costs in the United States.

Objectives: In 2021, healthcare spending consumed nearly 20% of the overall GDP in the United States and was the leading cause of medical debt among families and individuals. However, understanding the potential financial toxicity on an individual patient is complicated by multiple factors. This study presents healthcare costs associated with common otolaryngology diagnoses from a single integrated delivery and finance system (IDFS) over five years. **Study Design:** Retrospective review. **Methods:** Patients with coverage from a single provider in 2014 with chronic rhinosinusitis (CRS), obstructive sleep apnea (OSA), recurrent acute otitis media (RAOM), sensorineural hearing loss (SNHL), voice and resonance disorders (VRD), and oral cancer were identified. Costs associated with those diagnoses were tracked and analyzed. **Results:** 30,851 members were identified in the year 2014 and followed until the end of 2019. While patients with oral cancer (\$14,518.96) followed by OSA (\$2,477.30) and SNHL (\$2,138.08) faced the highest total healthcare charges, patients with OSA (\$419.99) and oral cancer (\$400.47)

demonstrated comparable out of pocket costs over five years. The costliest services included ambulatory surgeries (\$222.12 for CRS and \$212.30 for SNHL), medical therapies and equipment (\$5230.48 for oral cancer and \$738.80 for OSA), and professional care (\$2822.48 for oral cancer). Conclusions: As confirmed by previous studies, the healthcare cost of oral cancer and OSA is burdensome. Interestingly, out of pocket cost in the first year after diagnosis is the highest among all conditions and tapers off in the following years. Further studies are needed to improve transparency of common healthcare costs in otolaryngology and guide the need for cost effectiveness studies.

86. Evaluating Recent Trends in Medicare Reimbursements between Male and Female Otolaryngologists

Corinne A. Pittman, MD, Washington, DC; Holly D. Shan, BS, Washington, DC; Varsha Harish, BS, Washington, DC; Amanda R. Walsh, MD, Washington, DC; Kelly A. Scriven, MD, Washington, DC; Sarah K. Rapoport, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the gender disparity trends in clinical productivity and reimbursement payments from Centers and Medicaid and Medicare Services (CMS) between male and female otolaryngologists.

Objectives: Data from 2017 demonstrated male otolaryngologists were more productive and received higher payments from Centers for Medicare and Medicaid Services (CMS) than female otolaryngologists. We sought to further evaluate these findings and determine whether they reflected historical trends in reimbursements patterns. Study Design: Retrospective cross-sectional analysis of publicly available CMS data from 2013-2019. Methods: CMS database was used to obtain total services provided, charges submitted, and physician reimbursements for otolaryngologists. A mixed model fit by restricted maximum likelihood (REML) was performed to assess for differences in Medicare payments between male and female otolaryngologists. Results: From 2013-2018, 43,184 otolaryngologists (6,556 women [15.2%] and 36,627 [84.8%] men) received Medicare reimbursements. Male otolaryngologists consistently submitted more charges for reimbursement (median [interquartile range (IQR), 291,539 [154,380-503,932] vs. 196,029 [94,849-337,224]) and a greater number of unique billing codes (median [IQR, 52.0 [34.0-72.0] vs. 41.0 [27.0-59.0]) than female otolaryngologists. Male otolaryngologists received greater Medicare reimbursements than female otolaryngologists (median [IQR, \$114,390 [\$61,732-\$184,209] vs. \$72,679 [\$34,855-\$122,473]). Contrast ratios of estimated marginal means for Medicare reimbursements between male and female otolaryngologists demonstrated 75-81% ($P < .001$) of the estimated payment for physician services were received by male otolaryngologists. Conclusions: Female gender is consistently associated with lower total services provided, charges submitted and Medicare reimbursement among otolaryngologists. Further analysis of practice patterns is warranted to better understand and reduce these gender disparities within otolaryngology.

87. Development of Standardized Epistaxis Management Pathways for Otolaryngologists and Emergency Physicians

Fatemeh Ramazani, MD, Calgary, AB Canada; Simran Pherwani, MSc, Calgary, AB Canada; James Brookes, FRCSC, Calgary, AB Canada; Jessica Clark, FRCSC, Calgary, AB Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) identify the need for clear practice algorithms for management of epistaxis; 2) recognize the distinct role of emergency physicians and otolaryngologists in the management of epistaxis; and 3) list the critical steps for management of epistaxis, based on literature review and expert consensus.

Objectives: Epistaxis accounts for a significant proportion of otolaryngology related emergency department encounters. A variety of management options for epistaxis exist, which have the potential to influence clinical outcomes, patient comfort, rate of repeat presentations, and use of more invasive management options. Given the variability in management of epistaxis, there is limited consensus and a lack of clear practice algorithms for practitioners. The primary objective of this study was to develop distinct epistaxis management pathways for otolaryngologists and emergency physicians. **Study Design:** A qualitative study was undertaken, using modified Delphi methodology and serial review by subject matter experts (SME). **Methods:** Participants included four otolaryngologists and one emergency physician. A framework for the proposed practice pathways was developed following extensive literature review. These pathways were then disseminated to SMEs for review of clarity and relevance to practice. **Results:** Two distinct clinical practice pathways were developed for emergency physicians and otolaryngologists, respectively. A patient information handout was also developed, based on SME recommendations, outlining post-treatment care. Serial review by SMEs was undertaken until no further modifications were suggested by participants. Incorporation of participant feedback allowed for finalization of the proposed pathways and patient information handout. **Conclusions:** The use of the practice pathways generated by this study for epistaxis management will facilitate consistent quality and comprehensiveness of patient care, improved stewardship of available resources, and help to streamline consultations. A followup study assessing practitioners' perceptions of the proposed pathways and comparison to current management practices is currently underway.

88. **Finding the Leaks in the Pipeline for Underrepresented Racial Minorities in Otolaryngology**

Sarah M. Russel, MD MPH, Chapel Hill, NC; Dennis O. Frank-Ito, PhD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand where barriers exist in recruitment and retention for underrepresented racial minorities in otolaryngology.

Objectives: Certain racial minority groups have lower representation in medicine than they do in the general population, and this worsens as they attempt to climb the academic medicine ladder. This study provides insights into the "leaky pipeline" for racial minorities in otolaryngology to determine where the leaks are occurring. **Study Design:** Using the Rank Equity Index (REI) to assess representation of racial minority trainees and faculty at each stage of their careers. **Methods:** Demographic data from the Association of American Medical Colleges was used to calculate the proportion of various racial groups presented at each stage of academic medical careers. Pairwise comparisons were made between ranks to determine groups' representation between levels. REI=1.00 implies parity between two ranks, REI > 1.00 showed above parity, and REI < 1.00 below parity. **Results:** Representation comparing medical students with full professors for Asian,

Black/African American, and Latinx/Hispanic otolaryngologists were significantly below parity (REI: 0.735, 0.300, 0.565, respectively). All three groups declined proportionally between resident and assistant professor levels (REI: 0.827, 0.535, 0.418, respectively). Among White faculty, gains in proportional representation lie exclusively among men - White women decline at each professorial level. Notably, American Indian/Alaskan Native (AIAN) and Native Hawaiian (NH) REI's could not be assessed as only one AIAN and no NH faculty are present in otolaryngology. Conclusions: Black/African American and Latinx/Hispanic physicians face worsening representation at each rung of the academic ladder, and Asian faculty reach the rank of professor less frequently than their White counterparts. AIAN and NH faculty are absent in otolaryngology, indicating a vital target for recruitment efforts.

89. **Assessment of Performance and Value of Nationwide Databases in Otolaryngology Literature**

Neel R. Sangal, MD, Philadelphia, PA; Austin Cao, BA, Philadelphia, PA; Jason Brant, MD, Philadelphia, PA

Educational Objective: This presentation should provide insight into the scientific impact that nationwide databases have had on major otolaryngology literature over the last decade.

Objectives: Nationwide database analyses (NDA) have proliferated in the otolaryngology literature over the past decade. They provide unique and valuable insight into rare disease and population based changes. There has been no previous evaluation of the impact of these studies in the broader context of otolaryngology literature. Study Design: 5 journals in otolaryngology with the highest percentage of NDA (The Laryngoscope, JAMA Otolaryngology, Head & Neck, Otolaryngology - H&N, American Journal of Otolaryngology) were selected for analysis between 2013 and 2022. Studies using the SEER, SEER Medicare, NCDB, NSQIP, and NIS were selected. Methods: Cross-sectional analysis was conducted through the Web of Science. Rates of NDA publication, citation count, and institution specific analyses were conducted. Self-citations were excluded. Results: 13,300 publications met the inclusion criteria, of which 431 (3.4%) were NDA. The year over year NDA percentage increase was 0.39% 95% CI: [-0.02 - 0.81]. Papers from the SEER database were the plurality of NDA (42.9%). SEER 21.52 [16.42 -26.63], SEER-Medicare 14.84 [12.84 -16.85], NSQIP 15.05 [12.37 -17.73], and NIS 20.19 [16.06 -24.31] databases had significantly higher average citation rates than non-database papers 12.15 [11.99 - 12.31]. The NCDB 10.48 [9.17 -11.80] had significantly lower rates of citation. Stratified for year of publication, citation rate of NDA has been declining at a faster rate than non-database studies (2.8x). Stratified for institution, ratio of institutional h-index in academic programs of NDA to non-database studies was 0.23 [0.21 - 0.25]. Conclusions: NDA contribute to the global otolaryngology literature with an appropriate rate and impact. These trends should continue to be monitored to ensure continued value.

90. **Satellite Clinics Are Increasingly Utilized by Academic Otolaryngology Departments in the United States**

Anirudh Saraswathula, MD MS, Baltimore, MD; Jonathan H. Chen, BA, Baltimore, MD; Carole Fakhry, MD MPH, Baltimore, MD; Shaun Desai, MD, Baltimore, MD; David W. Eisele, MD, Baltimore, MD; Murugappan Ramanathan Jr., MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants

should be able to iterate the growing importance of satellite clinics in academic otolaryngology practices across the United States.

Objectives: Satellite clinics, ambulatory clinic spaces separate from the main hospital campus, present a growing model of care delivery designed to optimize patient access, quality and safety, and revenue streams. Our objective was to characterize the perceptions of academic otolaryngology chairpersons on satellite clinics to clarify trends in academic practice management. **Study Design:** Survey. **Methods:** Survey of U.S. chairpersons of non-military academic otolaryngology departments sent on May 19 and June 17, 2022 (50/106 [47.2%] response rate). **Results:** The majority of responding chairpersons led programs in the south Atlantic (11, 22.0%), middle Atlantic (9, 18.0%), and Pacific (7, 14.0%), most with over 10 full time faculty. Faculty seeing patients at satellite clinics are reportedly promoted at the same rate as other faculty in 84.8% of programs and publish as much research at 63.0%. 39.5% (SD 24.6%) of ambulatory volume and 41.1% (SD 25.5%) of ambulatory revenue is reportedly derived from satellite clinics. Half of programs had a satellite clinic associated ASC which handled an estimated 61.0% (SD 25.3%) of their ambulatory operative cases. 72.0% reported residents rotating at satellite clinics and ASCs. Programs unanimously plan to maintain or increase their satellite clinic volume. **Conclusions:** Satellite clinics represent a critical emerging element in most U.S. academic otolaryngology programs. While these data represent only academic chairpersons and not all faculty, they suggest a positive perception of satellite clinics within academic otolaryngology. Most programs plan to increasingly use these satellite clinics in the coming years to expand access for patients while improving clinical efficiency and resident education.

91. Adverse Events Associated with Tonsillectomy: A MAUDE Database Analysis of the COBLATOR and BiZact Devices

Elizabeth A. Sell, BA, Philadelphia, PA; Neel R. Sangal, MD, Philadelphia, PA; Tiffany N. Chao, MD MEd, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand adverse events associated with 2 devices, COBLATOR and BiZact, that have been increasingly utilized over the past decade.

Objectives: Two common systems utilized in tonsillectomy are the Smith & Nephew COBLATOR II ENT surgery system (COBLATOR) and the Medtronic BiZact tonsillectomy device (BiZact); however, little is known about adverse events associated with either system. **Study Design:** We performed a retrospective cross-sectional study using the US Food and Drug Administration's MAUDE database (2012-2022; Manufacturer and User Facility Device Experience). **Methods:** The MAUDE database was queried for reports of adverse events involving the use of COBLATOR and BiZact by the Food and Drug Administration. These were then selected for primary procedure -- tonsillectomy, and root cause analysis was performed, classifying reports by event characteristic, injury, and complication. **Results:** There were a total of 304 reported adverse events for COBLATOR and 79 events for BiZact from 2012-2022. The rate of reports per year for COBLATOR decreased on average at a rate of 77.9% (2012-111, 2021-5) compared to 70.2% for BiZact (2017-22, 2021-4). The most common event for the COBLATOR was generator function, accounting for 80 (26.3%) of all events. The most common event for BiZact was wand function, accounting for 20 (25.3%) of all events. Additionally, bleeding was reported as an adverse injury for 48 (60.8%) of total events for BiZact compared with 69 (22.7%) for COBLATOR. Burns accounted for 2 (2.5%) and 18 (5.9%) of all events

for COBLATOR and BiZact, respectively. Conclusions: Therapeutic device choice for tonsillectomy is constantly evolving. In this study we review adverse events associated with 2 devices that have been increasingly utilized over the past decade.

92. The Association of BMI and Perioperative Complications in Orthognathic Surgery

Swapnil V. Shah, BS, Omaha, NE; Nikolas R. Block-Wheeler, MD, Oakland, CA; Kalena H. Liu, BS, New York, NY; Miranda L. Weintraub, PhD MPH, Oakland, CA; William B. Williams, MD DMD, Oakland, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to assess the relationship or the lack thereof between BMI and total time under anesthesia, total operative time, need for additional postoperative antibiotics or additional postoperative visits, and the incidence of wound dehiscence or infection for patients undergoing orthognathic surgery.

Objectives: This study attempts to assess the possible association between body mass index (BMI) and perioperative complications in orthognathic surgery. Study Design: Retrospective cohort study. Methods: The study cohort consisted of patients who underwent orthognathic surgery from 2015-2018 by a single surgeon in an integrated healthcare system. BMI was assessed as both a continuous and categorical variable. Bivariate and multivariate analyses were performed to assess the relationship between BMI and operative time, anesthesia time, additional postoperative antibiotics, presence of wound dehiscence or infection, and number of postoperative visits. Results: We identified 118 patients who met inclusion criteria and who were stratified by NIH defined BMI categories. An additional analysis split the cohort into two groups with a BMI cutoff of 30 kg/m². A BMI greater than or equal to 30 kg/m² was significantly associated with increased operative time (p less than 0.05). Total anesthesia time, additional postoperative antibiotics, presence of wound dehiscence or infection, number of postoperative visits, and history of difficult intubation were not significant in bivariate and multivariate analysis. Conclusions: A BMI greater than or equal to 30 kg/m² is associated with higher operative time, but BMI does not appear to affect the risk of perioperative complications of orthognathic surgery. Better understanding of patient factors affecting their perioperative risk, however significant, is important for appropriate patient selection. Further studies assessing the relationship between BMI, potential confounding variables, and perioperative complications are warranted.

93. Evaluating the Quality, Credibility, and Readability of Online Information about Over the Counter Hearing Aids

Veranca S. Shah, BS, Washington, DC; Christian X. Lava, MS, Washington, DC; Amir A. Hakimi, MD, Washington, DC; Michael Hoa, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand and identify the purpose, significance, and limitations of online resources regarding over the counter hearing aids in terms of their quality, credibility, reliability, and accessibility.

Objectives: The internet is used frequently by patients to acquire health information. With over the counter hearing aids being recently approved by the FDA, the sources, nature, accuracy, and usefulness of their information has not yet been

examined. As a result, this study aims to evaluate the quality, credibility, readability, and accessibility of these education materials. Study Design: Cross-sectional analysis. Methods: Google was queried using the search term “over-the-counter hearing aids”. The top 50 results were categorized into healthcare versus non-healthcare authored resources. The Flesch Reading Ease Score (FRES) and Flesch-Kincaid Grade Level (FKGL) tests were utilized to assess readability, while the Currency, Relevance, Authority, Accuracy, and Purpose (CRAAP) test and DISCERN instrument were used to assess quality and credibility. The number of clicks taken to access relevant information on each website was used to assess accessibility. Results: There was no significant difference in both FRES and FKGL readability scores between healthcare and non-healthcare authored websites ($p = 0.5548$, $p = 0.5981$ respectively), but both readability scores were higher than that of the recommended reading level for patient education materials. There was also no significant difference in CRAAP and DISCERN scores between both groups ($p = 0.5746$, $p = 0.1699$ respectively). The number of clicks also did not significantly differ between healthcare and non-healthcare authored resources ($p = 0.4932$). Conclusions: The lack of significance in all of the variables assessed highlights the universal limitations of online patient materials regarding OTC hearing aids lacking relevant credibility, quality, and comprehensibility for the average reader. There are methods that authors can utilize to improve these factors in the future, such as focusing on a limited number of key concepts, using simple terminology, and using visual aids.

- 94. Sex Disparities in Academic Otolaryngology Rank and H-Index**
 Delaney Hennessy Sheehan, MD, Birmingham, AL; Kathryn Norma Marie Sawyer, BS, Birmingham, AL; Hunter Hobson Johnson IV, BS, Birmingham, AL; Do-Yeon Cho, MD MS, Birmingham, AL; Bradford A. Woodworth, MD, Birmingham, AL; Jessica W. Grayson, MD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to determine whether there are disparities in the scholarly performance of academic otolaryngologists related to rank and h-index.

Objectives: Determine whether there are disparities in the scholarly performance of academic otolaryngologists related to rank and h-index. Study Design: Cross-sectional analysis of academic otolaryngologist’s rank within their institution and bibliometric data. Methods: Faculty personnel listings from all academic otolaryngology departments in the United States and Puerto Rico were analyzed for academic rank. We determined h-index from the Scopus database for each physician. Prior data published in 2013 was utilized for comparison. All data was collected in June 2022. Results: We identified 2315 physicians with academic affiliations according to departmental listings. The mean h-index for all physicians was 13.2 ± 12.9 . Men had a statistically higher average h-index when compared to women (14.8 ± 13.7 v 8.9 ± 9.3 , $p < 0.001$). More males serve as chairpersons of their departments (5.9% vs. 2.1%, $p < 0.001$). Men were also more likely to be professors (27% vs. 11.5%, $p < 0.001$) when compared to women. H-index increased according to each academic position up to the rank of chairperson regardless of sex. However, men were more academically productive according to h-index at every level (assistant professor: 6.6 ± 5.4 vs. 5.5 ± 4.1 , $p < 0.05$; associate professor: 12.5 ± 7.5 vs. 9.6 ± 6.9 , $p < 0.001$; professor: 28.06 ± 15.96 v 23.08 ± 13.61 , $p < 0.05$; chairperson: 27.7 ± 12.3 vs. 16.9 ± 9.8 , $p < 0.05$). This is in contrast to prior published data where the h-index of women surpassed men at senior ranks. Conclusions:

While the number of women in academic otolaryngology has increased over the last two decades, there are still disparities related to female sex in research productivity and academic rank.

95. Impact of the Standardized Interview Offer Date Initiatives: A Survey of Otolaryngology Applicants and Programs

Taylor C. Standiford, MD, San Francisco, CA; Marc C. Thorne, MD MPH, Ann Arbor, MI; C.W. David Chang, MD, Columbia, MO; Sonya Malekzadeh, MD, Washington, DC; Steven D. Pletcher, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the previously chaotic nature of receiving and scheduling residency interviews and describe the compliance with and impact of a newly implemented standardized interview offer date system.

Objectives: To investigate residency applicant and program compliance with and attitudes towards a newly implemented standardized interview offer date program. **Study Design:** Survey sent via email to applicants and program directors. **Methods:** An electronic survey was distributed to applicants during match week in March 2022 and to program directors and program managers shortly after. The surveys included questions assessing program compliance with the standardized interview offer date as well as both applicant and program attitudes towards this newly implemented initiative. **Results:** This study achieved a 47% (263/559) response rate from applicants and 57% (68/120) from programs. Both applicants and program directors reported high program compliance with this initiative. 96% of program directors reported complying with releasing interview offers on one standardized day. Applicants endorsed a reduction in their anxiety surrounding the residency application process as well as increased ability to engage in the fourth year of medical school as benefits of the initiative. Providing clarity surrounding applicant's final application status and additional standardization of the interview scheduling process were identified as areas for improvement. **Conclusions:** Standardization of residency interview offer and acceptance practices is both feasible and impactful. Providing applicants with a final applicant status and further efforts to improve the interview scheduling process may continue to bolster this initiative in future years.

96. Awareness of Ramsay Hunt Syndrome: The Justin Bieber Effect

Trevor R. Torgerson, DO, Durham, NC; Austin L. Johnson, DO, Galveston, TX; Matt Vassar, PhD, Tulsa, OK; Micah Hartwell, PhD, Tulsa, OK

Educational Objective: At the conclusion of this presentation, the participants should be aware of 1) the effect public figure health disclosures have on internet and social media activity; and 2) ways to leverage increased public activity around a health topic for the greater good.

Objectives: Given that Ramsay Hunt syndrome (RHS) has a good prognosis if diagnosed early, we sought to examine the effect of Justin Bieber's public health disclosure on awareness for RHS using Google and YouTube search trends, Twitter activity, and Wikipedia page visits. **Study Design:** Cross-sectional analysis. **Methods:** We extracted data from Google Trends, Sprout Social, and Pageviews

Analysis. This data included search terms related and pageviews related to RHS. We then used an autoregressive integrated moving algorithm (ARIMA) to forecast expected search trends, Twitter activity, and pageviews had the disclosure not occurred. Lastly, we compared this forecasted outcome to our observed outcome to yield a percent change. Statistical analysis was conducted using R (R Core Team, v4.0.2). Results: Search trends for "RHS" increased by 19,900% (95% CI, 19,800% - 20,000%) the day after disclosure compared to the expected model. Twitter activity for RHS increased, above the forecasted model, by 433,821% (95% CI, 433,301% - 434,141%) the day of disclosure. A similar increase was seen with Wikipedia pageviews the day of disclosure and was sustained to the end of our sample with 1340.7 (95% CI, 1210.6 - 1470.1) mean views per day a month after disclosure compared to 171, the maximum number of views in our sample prior to disclosure. Conclusions: Our findings suggest Justin Bieber's public disclosure of his RHS diagnosis was associated with increased and sustained online activity surrounding RHS. The disclosure of his RHS diagnosis may be useful in improving symptom recognition by the public, thus, leading to more timely diagnosis and treatment and potentially improved outcomes.

97. The Association of Multiple Sensory Impairment and Telomere Length: The Health ABC Study

Varun Vohra, BA, Baltimore, MD; Michael Cheng, MD, Baltimore, MD; Qian-Li Xue, PhD, Baltimore, MD; Andrew P. Lane, MD, Baltimore, MD; Yuri Agarwal, MD, Baltimore, MD; Nicholas R. Rowan, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to characterize the role of sensory decline as a marker of aging in older adults through the relationship of sensory impairment and an established genetic marker of aging, leukocyte telomere length.

Objectives: The objective of this study was to characterize the associations of impairments in vision (VI), olfaction (OI), hearing (HI), and touch (TI) with telomere length in a group of community dwelling older adults who participated in the Health ABC study. Study Design: Cross-sectional observational study. Methods: Across 1,586 participants, OI was classified with the Brief Smell Identification Test (less than 11), HI with pure tone averages (less than 25 decibels), VI with visual acuity (20/50 or worse), and TI with monofilament testing (inability to detect three of four touches). Shorter telomere length was defined as the lowest quartile of sample telomere lengths. Adjusted multivariable regressions were used to examine the cross-sectional association between the modality, severity, and number of sensory impairments and telomere length. Results: Participants had an average age of 77.5 +/- 2.8 years, and 61% had one or more sensory impairments. Severe OI (OR = 1.76, 95% CI = [1.19, 2.6]) was independently associated with increased odds of shorter telomere length. Additionally, having one (OR = 2.76, 95% CI = [1.54, 5.11]), two (OR = 2.45, 95% CI = [1.37, 4.6]), three (OR = 3.6, 95% CI = [1.89, 7.0]), or four impairments (OR = 5.8, 95% CI = [2.43, 14.2]) was associated with increased odds of shorter telomere length in a dose dependent manner. Conclusions: Severe OI appears to be a particularly robust marker of shortened telomere length. Additionally, multiple sensory impairment is strongly associated with shortened telomere length, suggesting that sensory dysfunction may represent a unique biomarker of unhealthy aging.

98. The History of the Harry Barnes Medical Society

Andrew Edward Wadley, BA, Washington, DC; Anise Diaz, BA, New York City, NY; Earl Harley, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to have a better understanding of the historical significance of the Harry Barnes Medical Society and the work that it does.

Objectives: To describe the history and impact of Dr. William Harry Barnes and the Harry Barnes Medical Society. **Study Design:** Historical account. **Methods:** Information was sourced from the Harry Barnes Medical Society website, accounts from members of the Society, and publicly available biographies. **Results:** The Harry Barnes Medical Society was founded by a group of Black otolaryngologists in 1969 with the goal “to provide future oriented opportunities to Blacks, Mexicans Americans, Native Americans and other historically underrepresented racial and ethnic groups in the growing field of Otolaryngology Head and Neck Surgery”. The society honors Dr. William Harry Barnes of Philadelphia, Pennsylvania who was the first Black person to be certified by an American specialty board in 1927. Today, the society promotes the advancement of medical students and otolaryngologists that come from historically underrepresented backgrounds and features events such as monthly grand rounds, specialty specific meetings at NMA and AAI-HNS annual meetings and more. **Conclusions:** After Dr. Harry Barnes, there have been a steady stream of Black doctors to join the field of otolaryngology, but it remains one of the specialties in which Black people are the most underrepresented. Therefore, the Harry Barnes Society has served as an organization to support the few members in the field and recruit and support future otolaryngologists from underrepresented groups.

99. **Parental Leave in Otolaryngology Residency**

Amanda Walsh, MD, Washington, DC; Veranca Shah, BS, Washington, DC; Sarah Rapoport, MD, Washington, DC; Kelly Scriven Weiner, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to promote understanding of the challenges encountered by residents who choose to take parental leave during otolaryngology residency.

Objectives: There has been little research conducted on otolaryngology residents' perspectives regarding parental leave (PL) policies during training. We sought to evaluate resident physicians' attitudes toward pregnancy, parenthood, and PL during otolaryngology residency. **Study Design:** Survey based study. **Methods:** A 43 item survey using Qualtrics XM (Seattle, Washington) was sent to otolaryngology program directors via email for distribution to residents. The study was conducted from May through June 2022. Questions addressed general demographics and participants' perspectives on PL during training. **Results:** 105 otolaryngology residents responded to the survey. One out of five residents (20%) had biological children during residency. Of these trainees, 71.4% took PL. Female residents usually took longer PL (4-6 weeks) than male residents (<2 weeks). The majority (93%) of residents who took PL during residency felt that the duration of their PL was inadequate. Although “strain on the residency program” was one of the most commonly cited barriers to taking parental leave, less than one-third of respondents felt that parental leave puts an unreasonable amount of strain on the program. Additional responses highlighted other challenges associated with child-bearing during residency including lack of program specific policies, lack of time

for prenatal appointments, and absence of lactation support postpartum. Conclusions: Otolaryngology residents face significant challenges during pregnancy and in the postpartum period. Several residents did not take any leave after childbirth, while others took shorter periods of leave than the 8 weeks of leave offered by the American Board of Otolaryngology policy. Nearly all residents did not feel satisfied with the duration of parental leave.

100. **Laser Marsupialization of Nasopharyngeal Cysts**

Michael T. Werner, MD PhD, New York, NY; Victor Kizhner, MD, New York, NY; Yosef Krespi, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the indications and treatment options for management of nasopharyngeal cysts.

Objectives: Nasopharyngeal cysts (NCs) represent acquired or embryological lesions, usually incidentally found endoscopically or radiologically. Symptoms can include nasal obstruction, aural fullness, conductive hearing loss or local compressive symptoms. Treatment options include observation, marsupialization, or excision. We propose a classification based on location and symptoms and suggest treatment options. Study Design: Retrospective 10 year case series of patients with NCs that were surgically treated. Methods: Chart analysis in accordance to an institutional review board with matching ICD codes was performed. Patient characteristics and patient reported symptom resolution following treatment and after a 6 month interval were reviewed. Treatment method, NC location, in-office vs operating room approach and complications were noted. Results: 32 patients met inclusion criteria. These include 25 central NCs and 7 lateral NCs (22 mucus retention, 9 Thornwaldt and 1 branchiogenic). All lesions were all successfully treated with laser marsupialization, 11 of them in the office. At 6 months followup, no recurrence was reported. No adverse events, bleeding or significant postoperative discomfort were reported. Conclusions: NCs are relatively common in up to 6% of endoscopies or routine radiologic studies and can be easily diagnosed. We advocate for observation in asymptomatic patients with NCs less than 1 cm. In symptomatic patients, lesions larger than 0.5cm causing nasal obstruction and located in lateral nasopharyngeal wall require attention. For lateral lesions a biopsy is advised. A transnasal endoscopic access allows office treatment. Laser marsupialization is a safe, reproducible single tool method.

101. **Variations in Payer Negotiated Facility Fees for Fibrin Sealant Products**

Roy Xiao, MD MS, Boston, MA; Vinay K. Rathi, MD MBA, Boston, MA; Rosh K.V. Sethi, MD MPH, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand differences in magnitude and variations in payer negotiated prices for fibrin sealant products.

Objectives: Little is known about pricing for fibrin sealants used across various otolaryngologic procedures, though there is evidence that Evicel and Vistaseal more consistently achieve rapid hemostasis in peripheral vascular surgery. CMS requires hospitals to disclose payer negotiated prices for all items and services. Study Design: We performed a cross-sectional analysis of payer negotiated prices for 10mL of four common liquid based fibrin sealant products: Artiss, Evicel,

Tisseel, and Vistaseal. Methods: We queried the Turquoise Health database for payer negotiated facility fees as of 8/2/22 and calculated a median price for each product at each hospital. We normalized prices to CMS wage index. We assessed price variation by calculating the ratio between the 90th and 10th percentile median prices for each procedure (across center ratio). Results: 656 hospitals disclosed prices for at least one fibrin sealant product. Evicel had the highest median price (\$3,488, IQR \$2,203-5,273 across n=351 hospitals); this was significantly greater ($p < 0.001$ for all) than the median prices for Artiss (\$2,060, IQR \$941-2,741, n=93 hospitals), Tisseel (\$1,365, IQR \$915-1,979, n=459 hospitals), and Vistaseal (\$1,561, IQR \$921-2,016, n=230 hospitals). Evicel had the greatest variation (across center ratio 9.0), followed by Artiss (8.0), Tisseel (5.6), and Vistaseal (4.1). Conclusions: We observed wide variation in payer negotiated prices for fibrin sealants. Prices for equivalent volumes of Evicel were significantly greater than prices for other fibrin sealants; this can inform surgeon decision making as providers face increasing pressure to lower the cost of care. Further research is necessary to further understand this difference along with potential differences in clinical outcomes.

102. **Aerosol Generation Patterns from Cadaveric Tonsillectomy: A Comparison of Dissection and Mitigation Techniques**

Michael Jay Ye, MD, Indianapolis, IN; Vincent J. Campiti, MD, Indianapolis, IN; Steven X. Chen, PhD, Indianapolis, IN; Fahad Hasnain, BS, Indianapolis, IN; Jae Hong Park, PhD, West Lafayette, IN; Sarah J. Burgin, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the risk of particulate exposure using various surgical equipment and techniques during tonsillectomy procedures and compare the effectiveness of different commonly available mitigation techniques.

Objectives: To quantify risk of particulate exposure using various surgical equipment and techniques during tonsillectomy procedures and compare the effectiveness of different commonly available mitigation techniques. **Study Design:** Basic science. **Methods:** Aerosols were measured second by second during multiple two minute trials of tonsillar dissection on human cadaveric tissue specimens with and without a suction mitigation device using an optical particle sizer. Surgical techniques included blunt dissection, monopolar electrocautery on the "coag" setting, monopolar electrocautery on the "cut" setting, and suction electrocautery. Aerosol mitigation methods investigated included smoke evacuation pencil and handheld suction alone or in combination. **Results:** Tonsillar dissection with monopolar electrocautery in either coagulation or cut modes was associated with a significant increase in particle number concentration in the small (0.300 to 0.897 micrometer), medium (0.898 to 2.685 micrometer), large (2.686 to 10.000 micrometer), and total (0.0300 to 10.000 micrometer) size distributions (p less than 0.001). Electrocautery on the "cut" setting resulted in an average total particle increase of 448.037 particles per cubic centimeter, which was greater than the total particles increase during dissection on the "coag" setting of 123.213 particles per cubic centimeter (p less than 0.001). All trialed suction mitigation devices reduced this aerosol generation to an amount not statistically different from baseline across all size distributions (p equals 1.000). **Conclusions:** Aerosol generation was observed during tonsil dissection with electrocautery and effectively mitigated with a variety of commonly available suction devices. These findings will aid practitioners in selection of tonsillar dissection and aerosol mitigation techniques.

103. Virtual Interviewing in the ERA of COVID-19: A Preliminary Analysis of Otolaryngology Residency Program Costs

Andrew Yousef, MD, San Diego, CA; Benjamin Bernard, MD, San Diego, CA; Deborah Watson, MD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should have an understanding of the costs associated with interviewing and be able to discuss the potential cost reductions associated with the virtual interview.

Objectives: A preliminary comparison of the program experience and costs associated with the virtual interview season during the 2020-2021 COVID-19 pandemic to the traditional in-person interview process during the 2019-2020 interview season. **Study Design:** Cross-sectional survey. **Methods:** A 33 item survey was sent to otolaryngology residency program directors requesting them to identify their experience and costs associated with virtual interviews during the 2020-2021 cycle and in-person interviews during the previous 2019-2020 cycle. Purchasing cost and opportunity cost were calculated for each program. **Results:** Twenty-two programs sent back completed survey responses. Program responses were equally represented among all regions of the United States. Between the 2020-2021 and the 2019-2020 interview seasons, programs received more applications (mean of 400 applications compared to 336 the year prior, $p < 0.001$) for a similar number of residency spots per program (3.04 spots/program in 2020-2021 compared to 3.0 spots per program in 2019-2020, $p = 0.715$). The virtual interview led to more half day interviews, shorter duration of each interview, and fewer interviews completed per interview date. Purchasing cost decreased by \$1940.46 or 73%, and person hours dedicated to the interview process decreased by 52.36 hours with the virtual interview. Total savings per program with virtual interviews were estimated to be \$6941.66. **Conclusions:** Virtual interviews in the setting of the COVID-19 pandemic led to a shift in application and interview patterns and was associated with a reduction in costs for programs when compared to the in-person interview format.

Head and Neck

104. MOVED TO PODIUM

105. Tolerance of Adjuvant Radiation Therapy in Patients with Head and Neck Cancer: An Analysis of the National Cancer Database

Gabriel T. Raab, BA, New York, NY; Christopher Babu, BA, New York, NY; Kaveh Zakeri, MD MAS, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand risk factors associated with poor tolerance of adjuvant radiation therapy in patients with head and neck cancer.

Objectives: Previous studies have shown older adults are less likely to receive indicated adjuvant radiation therapy for head and neck cancer, but completion of adjuvant radiation and risk factors associated with incomplete treatment are not well studied. **Study Design:** Population based cohort using the National Cancer Database (NCDB). **Methods:** Patients with primary stage III-IVB cancer of the hypopharynx, larynx, oral cavity, or oropharynx were included. Non-standard radiotherapy cases, including brachytherapy, were excluded. Only patients with a single malignancy, negative surgical margins, no extranodal extension, and receipt of ad-

juvant radiation without chemotherapy were included. Inadequate radiation dosing was defined as less than 50 Gy. Chi squared, logistic regression and Pearson were used for univariable, multivariable, and correlation analysis, respectively. Results: The cohort included 8,274 patients with 1,474 patients receiving partial dose radiation and 6,800 receiving full dose. Patients with higher socioeconomic status, residing near academic centers, with non-larynx cancers, and with younger age were more likely to receive full dose radiation in both univariable and multivariable analysis ($p < 0.05$ for all). Patients older than 70 received a lower mean dose of radiation than younger patients (55.91 vs 57.35 Gy, $p < 0.001$). Similarly, increasing age was negatively correlated (-0.051) with radiation dose ($p < 0.001$). Conclusions: A substantial proportion of patients receiving adjuvant radiation do not complete the full treatment. Older age, lower socioeconomic status, treatment at nonacademic centers, and larynx cancers were associated with early termination of radiation therapy. Future studies should examine strategies to improve tolerance of adjuvant radiation therapy so that more patients complete the full treatment.

106. **Investigating Epithelial Subpopulations in Head and Neck Tumors by Single Cell RNA Sequencing**

Mary Catherine Bedard, BS, Cincinnati, OH; Alessandro de Alarcon, MD, Cincinnati, OH; Kathryn A. Wikenheiser-Brokamp, MD PhD, Cincinnati, OH; David F. Smith, MD PhD, Cincinnati, OH; Mike Adam, MS, Cincinnati, OH; Susanne I. Wells, PhD, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to identify differences in the composition and signatures of epithelial subpopulations in HPV+ and HPV- HNSCCs that may contribute to tumor phenotypes and clinical treatment response.

Objectives: To identify transcriptomic signatures of epithelial subpopulations in HPV+ vs HPV- HNSCC that underlie tumor phenotypes and treatment response differences. Study Design: Cross-sectional study. Methods: Published single cell RNA sequencing (scRNAseq) data from 6 HPV+ and 12 HPV- primary head and neck squamous cell carcinomas (HNSCCs) was accessed and processed using the 10x cell ranger pipeline. Clusters identified as epithelial cells were isolated and reclustered. Using this dataset, differentially expressed genes (DEGs) of cells originating from HPV+ versus HPV- tumors were identified. Each scRNAseq cluster was considered a distinct epithelial subpopulation. The transcriptomes and DEGs of select clusters were analyzed using the gProfiler web server for gene ontology (GO) terms to identify cell types. Subpopulation specific signatures were determined by KEGG, WikiPathways, and Reactome pathway analysis. Complex enriched gene sets were visualized using the enrichment map app within Cytoscape. Results: Epithelial cells from 18 patients with HNSCC tumors were successfully identified in published scRNAseq data and categorized as originating from HPV+ or HPV- tumors prior to joint reanalysis. Global differential expression analysis of HPV+ vs HPV- HNSCC tumors identified differences in pathway enrichments. Unbiased clustering resulted in distinct epithelial subpopulations, with some enriched in HPV+ versus HPV- tumor. Subpopulations were categorized as potential tumor driving or tumor supporting cell types based on proliferation status. Specific transcriptome signatures of epithelial subpopulations yielded ontologies and differentially expressed pathways that correlated with published HPV specific tumor microenvironment and treatment response data in the literature. Conclusions: We hypothesize that differentially expressed pathways in HPV+ vs HPV- tumor supportive subpopulations are important components of the pro-tumor microenviron-

ment, candidate targets for new HNSCC therapies, and determinants of treatment response.

107. Benign Follicular Hyperplasia with Clonal B Cells: A Rare Cause of Unilateral Tonsillar Enlargement

Joseph A. Bellairs, MD, Seattle, WA; Kevin Yu, MD, Seattle, WA; Zhao Ming Dong, MD PhD, Seattle, WA; Zain H. Rizvi, MD, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the differential diagnosis for unilateral tonsillar enlargement and compare the diagnosis of benign follicular hyperplasia with clonal B cells to other lymphoproliferative disorders.

Objectives: Primary extranodal lymphomas of the head and neck account for 10-20% of all lymphomas; however, primary tonsillar lymphoma accounts for less than 1% of all head and neck malignancies. Regardless, lymphoma should always be on the differential for atypical tonsillar masses in addition to the broad differential for masses of the Waldeyer's ring. We present a case report of an elderly gentleman with incidental tonsillar mass found to be a rare case of follicular hyperplasia resulting in a nonmalignant clonal B cell population. Study Design: Case report and literature review. Methods: We present a case report of a patient presenting with a tonsillar mass found to be follicular hyperplasia with clonal B cells. We performed a literature review for this condition using the key words follicular hyperplasia, clonal B cells, and tonsillar enlargement. Results: This patient presented with an enlarging oropharynx mass suspicious for lymphoma or primary head and neck cancer. An initial biopsy was suggestive of lymphoma with a need for more tissue for definitive diagnosis. A followup transoral robotic resection yielded a clonal B cell expansion with molecular studies revealing a TET2 mutation but without BCL-2 nor t(14;18) changes suggestive of malignancy. This represents a rare case of follicular hyperplasia with a monoclonal yet benign B cell expansion. Conclusions: Follicular hyperplasia is a relatively common finding in lymphoid tissue, however follicular hyperplasia with clonal B cells remains an exceedingly rare, benign diagnosis, and has only been reported in young patients. The histopathologic hallmark is prominent, clonal, follicle center B cell populations, but in which the histologic features demonstrate reactive follicular hyperplasia without evidence of bcl-2 overexpression or the t(14;18) rearrangement. Molecular studies are critical to differentiate this entity from its malignant counterpart and observation is a reasonable treatment strategy given the low risk for malignant transformation.

108. Outcomes following Treatment of Carotid Blowout Related to Head and Neck Cancer

Kavita Bhatnagar, MD, Portland, OR; Allison Slijepcevic, MD, Winston-Salem, NC; Sara Yang, MD, Portland, OR; Michelle Bunke, BS, Portland, OR; Kenneth Tan, BS, Portland, OR; Mark K. Wax, MD, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants should be able to understand various methods to treat carotid blowout, as well as overall complication and survival rates following treatment.

Objectives: Determine outcomes after treatment of carotid blowout. Study Design: Retrospective review. Methods: Patients with head and neck cancer treated for carotid blowout between 2009-2021 were included. Pre-treatment, treatment and post-treatment variables were evaluated. Results: 15 patients were included, M:F

ratio 3:2. Cancer subsites included 2 (13.3%) oral cavity, 5 (33.3%) oropharyngeal, 6 (40.0%) laryngeal and 2 others. All underwent radiation, either primary (n=11, 73.3%) or adjuvant (n=6, 33.3%). 86.7% of blowouts occurred within 6 months of recent intervention, with 60.0% having sentinel bleeds. Initial treatment was with coil embolization (n=4, 26.7%), stenting (n=9, 60.0%), carotid ligation (n=1, 6.7%) or carotid bypass (n=1, 6.7%). 33.3% underwent subsequent carotid bypass and any stents in place (n=4) were removed during carotid replacement. 46.7% (n=7) then had carotid coverage with pedicled flaps, 13.3% (n=2) with free flaps, and 40.0% (n=6) had no coverage. One patient developed stroke after embolization. Four patients re-bleed, three within 1 month. Overall, 53.3% (n=8) died within 6 months of blowout, including 2 who died within days of initial bleed and 1 of re-bleed. One died of stroke from bypass stenosis. 1 year survival was 40.0% and two-thirds of these patients had bypass with flap coverage. Many died of cancer progression or other causes. Conclusions: Most carotid blowouts occur within 6 months of surgery or radiation and of those who are treated, 26.7% re-bleed. 6 month survival is 47.7% and 1 year survival is 40.0%; however, 80% of deaths are unrelated to bleeding. Carotid bypass with flap coverage may be a worthwhile treatment for carotid blowout.

109. A Dual Purpose for Tracheoesophageal Puncture: Closure of Tracheoesophageal Fistula and Voice Restoration after Total Laryngectomy

Benjamin F. Bitner, MD, Orange, CA; Isaac P. Obermeyer, MD, Orange, CA; Monica S. Trent, MD, Orange, CA; Eric H. Abello, MD, Orange, CA; Tjason Tjoa, MD, Orange, CA; Yarah M. Haidar, MD, Orange, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss characteristics of tracheoesophageal fistula and surgical management with the use of tracheoesophageal puncture.

Objectives: Total laryngectomy (TL) remains the most effective treatment in advanced laryngeal squamous cell carcinoma (SCC) and for salvage in chemoradiation failure. Wound breakdown following TL is a common complication including the formation of a tracheoesophageal fistula (TEF). Several closure techniques have been developed to overcome this problem, including injections around the fistula, primary closure, flaps, or use of silicon button. We describe the use of tracheoesophageal puncture (TEP) in two cases for closure of a TEF with the dual purpose of voice restoration after TL. Study Design: Case series and literature review. Methods: Two cases are presented, and a literature review was performed on PubMed searching keywords including total laryngectomy, laryngeal squamous cell carcinoma, tracheoesophageal fistula, tracheoesophageal puncture, repair. Results: The first patient was a 60 year old male with supraglottic SCC who failed primary chemoradiation ultimately requiring salvage TL. Postoperative course was complicated by development of TEF that was repaired with TEP. Patient is currently working with speech therapy for voice restoration and is tolerating diet without aspiration. The second patient was a 63 year old male with supraglottic SCC status post TL. Postoperative course was complicated by development of TEF that was repaired with TEP. TEP subsequently extruded overtime and the fistulous tract healed as noted on recent esophagoscopy without further interventions. Conclusions: TEP for repair of TEF is a safe, minimally invasive technique that offers the additional benefit of voice restoration. This technique may be considered prior to pursuing more aggressive repair techniques.

110. Risks Associated with Extent of Surgical Management of Benign, Nontoxic Goiter: An Analysis of the Thyroidectomy Specific NSQIP Database

Jacob S. Brady, MD, Seattle, WA; Austin Lam, MD, Seattle, WA; Neeraja Konuthula, MD, Seattle, WA; Zain H. Rizvi, MD, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the independent risks associated with both partial and total thyroidectomy when performed for benign, nontoxic goiter, and use this information to aid in patient centered, shared decision making when discussing surgical management.

Objectives: Surgery for benign nontoxic thyroid goiter remains the most common indication for thyroidectomy worldwide yet optimal surgical extent remains controversial. We sought to 1) characterize the comorbidities and outcomes associated with patients undergoing thyroid surgery for benign, nontoxic goiter; and 2) compare surgical complications associated with partial and total thyroidectomy. Study Design: Retrospective database analysis. Methods: This is an analysis of the National Surgical Quality Improvement Program (NSQIP) thyroid specific dataset combined and general NSQIP dataset for the years 2016-2020. Multivariate analyses of postoperative outcomes associated with extent of surgery in the treatment of benign, nontoxic goiter were performed. The multivariate analysis controlled for extent of disease, demographics, preoperative comorbidities, and perioperative factors, and was designed to determine if total thyroidectomy was an independent predictor of postoperative complication when compared to partial thyroid surgery. Results: Overall, 11,726 thyroidectomies were performed for benign, nontoxic goiter (6,535 partials and 5,191 totals). Total thyroidectomy was associated with significantly greater odds of any complication (OR=1.7, CI=1.5-1.9), any thyroidectomy specific complication (OR=1.7, CI=1.5-2.0), and any medical complication (OR=1.6, CI=1.1-2.6), as well as increased odds of RLN dysfunction (OR=1.4, CI=1.1-1.7), hypocalcemia prior to discharge (OR=3.3, CI=2.4-4.5), hypocalcemia after discharge (OR=3.3, CI=2.4-4.5), and severe hypocalcemia (OR=4.6, CI=3.0-7.0). Conclusions: This is the largest study to date examining the risks related to extent of surgical resection for benign, nontoxic goiter. When controlling for comorbidity, extent of disease, and calcium repletion, total thyroidectomy patients had significantly greater rates of surgical complications. These data regarding risks and complications should inform shared decision making when determining extent of surgical intervention.

111. Transoral Robotic Surgical Resection of Bilateral Parapharyngeal Space Rhabdomyoma

Jacob S. Brady, MD, Seattle, WA; Zain H. Rizvi, MD, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the complexity and risks associated with the resection of parapharyngeal space masses, and the unique role that modern transoral robotic techniques can play in reducing this risk, decreasing morbidity, and improving patient satisfaction.

Objectives: We seek to demonstrate that the 1) the resection of even benign lesions of the parapharyngeal space poses distinct surgical risks to the carotid artery, internal jugular vein, cranial nerves IX-XII, and the cervical sympathetic chain; and 2) that transoral robotic techniques can help to mitigate these risks while also pro-

viding excellent visualization, minimal morbidity, and no external incisions. Study Design: Case report. Methods: This is 77 year old male presenting with dysphagia. He was found to have a large, multi-loculated, prestyloid, right parapharyngeal mass extending from the skull base to the suprahyoid epiglottis and laterally to the deep parotid lobe. He also had a smaller, left mass which traced around the stylo-mandibular ligament and towards the deep parotid gland. Biopsy showed rhabdomyoma. A TORS approach was used for resection. The glossopharyngeal nerves were identified, preserved, and retracted. The internal maxillary artery and branches were identified, clipped, and ligated. Both masses were removed en bloc. Results: The patient tolerated the procedure without any immediate complications. His postoperative dysphagia, although initially somewhat profound, improved dramatically with a 24 hour course of intravenous dexamethasone. He had no other significant concerns in the immediate postoperative period and was discharged on a soft diet, eventually advancing to a regular diet. Conclusions: Extensive surgery within the parapharyngeal space can pose significant risk and includes large volume hemorrhage and persistent cranial neuropathies with resultant dysphonia or dysphagia. Transoral robotic surgery represents a new, safe modality to access the parapharyngeal space with excellent visualization, minimal morbidity, and no external incisions.

112. **Germline Genetic Testing in Unselected Head and Neck Cancer Patients: A Multicenter Prospective Study**

Daniela A. Brake, MD, Phoenix, AZ; Beau M. Idler, BA, Phoenix, AZ; Michael A. Golafshar, MS, Phoenix, AZ; Michael L. Hinni, MD, Phoenix, AZ; Brent A. Chang, MD, Phoenix, AZ; Niloy Jewel Samadder, MD, Phoenix, AZ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the prevalence and implications of pathogenic germline variants found in a heterogenous population of head and neck cancer patients, and understand the current role and basic limitations of germline genetic testing in the management of head and neck cancer.

Objectives: Testing to identify patients for actionable germline mutations currently is not standard of care for most head and neck cancers. This study aimed to describe pathogenic germline variants (PGVs) in head and neck cancer patients using a universal testing approach, the incremental findings if not performed, association with clinical characteristics, and uptake of family variant testing. Study Design: Prospective cohort study. Methods: Germline sequencing using an 84 gene next generation screening platform among 200 unselected head and neck cancer patients who received care at three tertiary academic medical centers between April 1, 2018, and March 31, 2020. Results: Patient median age was 62.0 years (Q1, Q3: 55, 71), 23.0% were female, 89.0% were white/non-Hispanic, 5.0% were Hispanic/Latino, 6% were of another race, and 42.0% had prognostic stage IV disease. The most common cancer subsites were oropharyngeal (45.0%), salivary gland (12.0%), and laryngeal (9.5%). The most common histology was squamous cell carcinoma (74.5%). Twenty-one had PGVs (10.5%); 20 (95.2%) did not meet criteria for genetic testing by current practice guidelines. One PGV was clinically actionable. Family variant testing was completed at a rate of 4.8%. Conclusions: Universal gene panel testing revealed presence of a PGV in 10.5% of head and neck cancer patients; almost all would have been missed by current guideline based testing. One of twenty-one patients had a treatment change due to their PGV, indicating that head and neck cancer treatment decisions are not yet

widely informed by most germline mutations.

113. Diagnosis and Management of Laryngeal Schwannoma with CO2 Laser and Cold Knife Technique

Taylor D. Brown, MHS, Nashville, TN; April Peterson, MD, Nashville, TN; William C. Scott, MD, Nashville, TN; Sarah Rohde, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the clinical presentation, diagnosis and management of rare laryngeal schwannomas.

Objectives: The aim of this report is to discuss the rare finding and management of a laryngeal schwannoma. Study Design: Case report and review of literature. Methods: Detailed description of the presentation, workup, and management of laryngeal schwannomas. Results: This study describes a 28 year old woman who presented to our facility with a chief complaint of hoarseness. Flexible nasopharyngeal endoscopic exam revealed normal vocal cord motion and a smooth mucosal covered lesion involving the left arytenoid. The patient had a previous biopsy showing schwannoma. Direct microlaryngoscopy was subsequently performed which revealed a well circumscribed 2 x 1.5cm lesion of the left arytenoid that was excised using CO2 laser and cold knife technique. Final pathology revealed a laryngeal schwannoma. Followup in the clinic showed surgical changes with continued normal vocal cord motion. Conclusions: Schwannomas occurring in the head and neck region are frequent, with 25-45% of all reported schwannomas being found in this region. Laryngeal schwannomas, while extremely rare, should be considered in the differential diagnosis for benign laryngeal masses. Preservation of function is a key in treatment of these benign lesions.

114. Putative Mediators of Epithelial-to-Mesenchymal Transition in Head and Neck Squamous Cell Carcinoma

Seth Michael Buryska, BS, Grand Forks, ND; Frank Ondrey, MD PhD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to have a greater insight into a seminal genomic alteration associated with the development and progression of head and neck squamous cell carcinoma.

Objectives: Evaluate SNAI1 (Snail) and SNAI2 (Slug) expression in head and neck cancer development using the TCGA. Study Design: Retrospective analysis of SNAI1/2 mRNA in NCI TCGA. Methods: SNAI1/2 expression parameters were examined in 520+ HNSCC samples using the NCI cBio Portal and the UAB Cancer Data Analysis Portal (UALCAN). Results: Neither SNAI1 or SNAI2 are in the top 150 overexpressed genes in HNSCC compared to normal tissue. However, SNAI2 and SNAI1 expression is increased in HNSCC compared to normal tissue ($p < 1e-12$, $p=2.39e-4$, respectively). SNAI2 expression is even greater in TP53 mutant populations compared to TP53 nonmutant ($p=2.16e-5$). SNAI2 is also increased in Asian populations compared to Caucasian and African American populations ($p=0.04$, 0.014). SNAI1 expression exhibited a stepwise increase comparing grade 1 vs 2 and grade 1 vs 3 tumors as well ($p=2.17e-5$, $4.99e-6$). SNAI2 mRNA expression demonstrates strong positive correlation with TGF- β , INHBA, and other pathways upregulated in HNSCC. Conclusions: SNAI1 and SNAI2 are known potent embryological stimulators of epithelial to mesenchymal transition resulting in met-

astatic properties in head and neck cancer. Genomic analysis of SNAI1/2 mRNA expression data from 496 HNSCC samples involving 20,000+ genes demonstrates SNAI2 expression are most strongly correlated with TGF- β and INHBA; two genes concomitantly upregulated in HNSCC. This genome based evidence of HNSCC tumor samples corroborates studies which postulate a potential link between INHBA, TGF- β , and SNAI1/2 via Smad complex activation as well as inflammatory cytokine dysregulation. Henceforth, this genomic analysis may be found useful in further defining a potentially seminal multigenetic relationship driving recurrent and metastatic properties in HNSCC.

115. The Role of a TGF-B Family Cytokine in Head and Neck Squamous Cell Carcinoma Development

Seth Michael Buryska, BS, Grand Forks, ND; Frank Ondrey, MD PhD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to have a greater insight into a seminal genomic alteration associated with the development and progression of head and neck squamous cell carcinoma.

Objectives: Examine expression parameters of INHBA (Activin A) in the highly dimensioned NCI TCGA. Study Design: Retrospective analysis of INHBA mRNA in NCI TCGA. Methods: INHBA expression parameters were examined in 520+ HNSCC samples using the NCI cBio Portal and the UAB Cancer Data Analysis Portal (UALCAN). Results: INHBA was only mutated in 1.2% of samples but was the 3rd most overexpressed gene in HNSCC. INHBA samples (N=528) had greater expressions ($p < 1e - 12$) and less promoter methylation ($p < 1.624e - 12$) compared to normal samples (N = 50). TP53 mutant samples had greater expression and less methylation compared to TP53 nonmutant ($p < 4.16e - 3$, $p < 1.793e - 8$) and control samples ($p < e1 - 12$, $p < 1.624e - 12$). HPV (+) samples had less INHBA expression compared to HPV (-) samples ($p < 6.01e - 5$). INHBA mRNA expression was positively correlated with multiple genes (ex: ITGA5, Spearman 0.76, $p = 1.18e - 91$). Conclusions: Activin A was the third highest differentially expressed gene in HNSCC TCGA. Genomic analysis uncovered potential epigenetic dysregulation as decreased promoter methylation is associated with increased tumor stage. This corroborates our previously published data which also indicated INHBA was strongly differentially expressed in the Affymetrix UAB30 system and was associated with HNSCC recurrence. Furthermore, genomic analysis of 20,000+ genes identified multiple genes strongly correlated with INHBA mRNA expression. Upon literature review, multiple recent studies found INHBA was able to activate multiple genes identified in this analysis. Thus, mRNA analysis of approximately 500 HNSCC tumor samples corroborated emerging literature indicating INHBA's potentially seminal role as a putative mediator of carcinogenic features like angiogenesis, metastasis, and resistance to apoptosis in HNSCC.

116. Prognostic Risk Factors in Buccal Squamous Cell Carcinoma

Jacquelyn K. Callander, MD, San Francisco, CA; Spenser S. Souza, MD MS, San Francisco, CA; Yasmin Eltawil, MD, San Francisco, CA; Chase M. Heaton, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the clinicopathologic presentation of buccal squamous cell carcinoma and identify risks factors for recurrence and overall survival.

Objectives: To describe the clinicopathologic presentation of buccal squamous cell carcinoma and identify risks factors for recurrence and overall survival. **Study Design:** Retrospective cohort study. **Methods:** Subjects were all patients with buccal subsite oral cavity squamous cell carcinoma (SCC) treated at a single tertiary care center between 2010 and 2022. Subjects without pathology reports or sufficient clinical data were excluded. Chart review was performed to collect relevant clinical and pathologic data. **Results:** 77 patients met inclusion criteria. The median followup time was 27 months (IQR 14-61). Median age at diagnosis was 67 (IQR 60-76) and 53% of the cohort was female. 20 subjects (26%) experienced recurrence, with a mean time to recurrence of 15.3 months (SD 13.2). On univariate analysis, the presence of perineural invasion (PNI) and positive margins increased the odds of recurrence. Positive margins remained a risk factor for recurrence on multivariate analysis controlling for demographic and pathologic factors. PNI was also found to be a significant risk factor for all cause mortality on univariate and multivariate analysis. 55% of recurrences occurred in patients with stage 1 or 2 cancer. This subset was more likely to undergo surgery without adjuvant therapy (75 and 55% for stage 1 and 2 cancers, respectively). **Conclusions:** Presence of PNI and positive margins were found to be poor prognostic risk factors predicting recurrence in patients with buccal SCC. PNI was also found to predict all cause mortality. Interestingly, early stage cancers had relatively high risk of recurrence, possibly related to lower rates of adjuvant therapy.

117. Evaluating Circulating Tumor HPV DNA as a Predictor of Residual Disease in Surgically Treated HPV Positive Oropharyngeal Squamous Cell Carcinoma

Austin C. Cao, BA, Philadelphia, PA; Ashna Aggarwal, BS, Philadelphia, PA; Robert M. Brody, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the potential utility of circulating tumor HPV DNA in the postoperative setting for making decisions on adjuvant treatment.

Objectives: Circulating tumor human papillomavirus DNA (ctHPVDNA) is a promising new technique for detecting residual and recurrent disease in human papillomavirus associated oropharyngeal squamous cell carcinoma (HPV+OPSCC). We sought to evaluate the use of ctHPVDNA for assessing disease status postoperatively in patients undergoing primary surgery for HPV+ OPSCC. **Study Design:** Prospective cohort study. **Methods:** Patients presenting for workup of HPV+ OPSCC and surgical evaluation at an academic institution were identified. Samples were collected at the initial clinic visit and processed using the NavDx platform for ctHPVDNA testing. Patients with biopsy confirmed HPV+ OPSCC who received primary surgical treatment also had blood tests collected in the postoperative period prior to receiving any adjuvant treatment. Residual disease was defined as recurrence within 1 month of end of treatment (EOT). **Results:** A total of 51 patients met the selection criteria, with 23 patients demonstrating biopsy confirmed HPV+ OPSCC and completing primary surgical treatment [median age of 62 (IQR: 52-69), 87% male]. Pathologic tumor staging included T1 (48%), T2 (48%), T3 (4%), while pathologic nodal staging (AJCC 8th edition) included N0 (17%), N1 (65%), N2 (18%). 91% (21/23) of patients had ctHPVDNA levels that decreased to undetectable levels postoperatively, while 9% (2/23) continued to have positive ctHPVDNA. Both patients in the positive ctHPVDNA cohort had positive surgical margins, compared to 3/21 in the negative ctHPVDNA cohort. Both patients with

positive cHPVDNA developed short term disease recurrence postoperatively, indicative of residual disease. No evidence of disease during treatment or within 1 month of EOT was observed in the negative cHPVDNA cohort. Conclusions: CtHPVDNA may provide a more specific method of assessing disease status postoperatively in patients with HPV+ OPSCC.

118. Flow through Microvascular Anastomosis in Double Free Flap Head and Neck Reconstruction: A Case Series

Katherine W. Chang, MD, St. Louis, MO; Jake J. Lee, MD, St. Louis, MO; Patrik Pipkorn, MD, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the surgical technique and presurgical conditions of flow through microvascular anastomosis in double free flap reconstruction.

Objectives: To describe the surgical technique and presurgical conditions of flow through double free flap reconstruction of the head and neck. Study Design: Case series. Methods: Patients who received head and neck free tissue reconstruction with 2 simultaneous free flaps and flow through arterial anastomosis (second free flap pedicle anastomosed to distal pedicle of first free flap) were identified. Vessel and free flap selection, prior treatments, outcomes, and surgical technique were described. Results: We identified 3 patients with simultaneous double free flap reconstruction and flow through vessel anatomy. Indications for reconstruction included necrotizing fasciitis, recurrent osteoradionecrosis, and large craniofacial defect due to squamous cell carcinoma. Double free flap types included radial forearm (RF) with gracilis, osteocutaneous RF with scapula, and anterolateral thigh (ALT) with femoral condyle. Recipient vessels for the first free flap included the facial artery and vein in 2 cases and the external carotid artery and its vena comitantes in 1 case. In all cases, the arterial pedicle of the second free flap was anastomosed to the distal pedicle of the first free flap. There were no free flap failures (total or partial) or significant wound complications (dehiscence, infection, fistula) in this case series. Conclusions: In patients with large, complex head and neck defects requiring double free flap reconstruction and limited vessel availability, the flow through technique can be utilized safely with good free flap outcomes in select patients.

119. Nonadherence to Recommended Adjuvant Radiation After Total Laryngectomy: Associations and Survival Impact

Bonnie Chen, MD, Columbia, MO; Michael Topf, MD, Nashville, TN; Robert P. Zitsch, MD, Columbia, MO; Gregory B. Biedermann, MD, Columbia, MO; Patrick Tassone, MD, Columbia, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to identify characteristics associated with nonadherence from guidelines after primary TL for locally advanced, node negative laryngeal and hypopharyngeal squamous cell carcinoma.

Objectives: Investigate trends and associated factors in guideline adherence to adjuvant radiation therapy in locally advanced laryngeal and hypopharyngeal cancer after primary total laryngectomy (TL). Study Design: Retrospective review of National Cancer Database (NCDB). Methods: Previously untreated, nonmetastatic patients who underwent TL for pathologic T3 or T4 larynx or hypopharynx squamous cell carcinoma (SCCa) were queried. Patients were excluded if they had

nodal metastasis or positive margins. Patient characteristics were evaluated for association with nonadherence to adjuvant radiation by logistic regression analysis. Association between nonadherence and overall survival (OS) was investigated by Cox proportional hazard analysis. Results: Among 4,300 eligible T3/T4, N0 patients, 1,707 (40%) did not receive adjuvant radiation. Associated factors include increasing age, increasing Charlson Comorbidity Index, larynx primary, T3 stage, greater distance to treatment center, and treatment at an academic cancer center. Delivery of adjuvant radiation was associated with improved OS on multivariable (HR 0.86, 95% CI 0.75-0.99) analysis. On subset analysis, adjuvant radiation was associated with improved OS for patients with T4 tumors (HR 0.71, 95% CI 0.63-0.80), but was not for T3 tumors (HR 0.97, 95% CI 0.82-1.14). Conclusions: Within the NCDB, nonadherence from adjuvant radiation treatment after TL for locally advanced, node negative larynx and hypopharynx SCCa is common. Older patients with more comorbidities and greater travel distance may be at higher risk for nonadherence. Especially among patients with T4 stage, lack of treatment with adjuvant radiation is associated with worse overall survival. However, among patients with T3 stage, nonadherence was not associated with worse overall survival.

120. **Correlation of Radiological and Histopathologic Findings in Clival Chordoma**

Aaron Craft, MD, Columbus, OH; Catherine Russo, BS, Columbus, OH; Annie Drapeau, MD, Columbus, OH; Aaron McAllister, MD, Columbus, OH; Tendy Chiang, MD, Columbus, OH; Patrick Walz, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the correlation between radiographic and clinical manifestations of patients with clival chordoma.

Objectives: To define the radiographic characteristics of clival chordoma and explore the correlation that exists between specific radiologic findings and histopathologic subtype of clival chordoma. **Study Design:** Retrospective single institution case series. **Methods:** After IRB approval, patients with biopsy confirmed clival chordoma treated at a tertiary referral children's hospital were included. Pathology reports were used to determine histological subtype. MRI images were reviewed by a radiologist blinded to histopathology and radiological findings were determined using a categorized list. Radiographic findings were then compared to subtype. **Results:** Seven children with clival chordoma were identified, four patients with conventional chordoma (57%) and three with poorly differentiated chordoma (43%). No patients were found to have evidence of necrosis on imaging. Intradural invasion was found in two patients with conventional chordoma (50%) and one patient with poorly differentiated chordoma (33%). Five cases had extension into the paranasal sinuses or nasopharynx, three conventional (75%) and two poorly differentiated (67%). The T2 tumor to CSF ratios in the poorly differentiated cases were 0.297, 0.307, and 0.366 while the ratios in conventional cases were all greater than 0.500. All cases were found to be hypointense on T1 weighted imaging. **Conclusions:** Poorly differentiated clival chordomas show decreased intensity as compared to conventional chordoma on T2 weighted MRI imaging. These findings are expected to correlate with the cellular makeup of the tumor subtypes.

121. **The Impact of Distance Travelled and Rurality on the Clinical Course of Head and Neck Cancer**

Nadia A. Debick, BS, Syracuse, NY; Amanda Gemmiti, MD, Syracuse,

NY; Jesse Ryan, MD, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the relationship between sociodemographic and clinical variables in head and neck cancer.

Objectives: To explore the relationship between distance travelled and rurality to clinical timepoints and 2 year disease free survival (DFS) in newly diagnosed HNC patients. **Study Design:** This study was conducted through retrospective analysis, with key independent variables including distance to academic medical center and rurality score. **Methods:** To better understand delays in care, the sample was divided into 2 groups based on an optimal treatment timeline. We then conducted an analysis to assess for the impact of distance travelled. **Results:** A higher proportion of patients in the optimal treatment timeline group resided in metropolitan areas, which also had a lower mean index of medically underserved score. Patients in this group had a shorter duration from first presentation for HNC to presentation to an academic medical center and a shorter duration from referral to presentation. However, there was no significant difference in 2 year DFS between the groups. Those who lived closest to the academic medical center were more likely to identify as Black. Those who live in suburban communities around the academic medical center were most likely to initiate treatment within 1 month of presentation. Those who live farthest from the academic medical center were the least likely to have an HPV negative cancer of the head and neck and more likely to receive surgery as part of treatment and to receive a biopsy prior to presenting to the academic medical center. **Conclusions:** Despite differences in distance travelled and rurality between communities, there was no impact on 2 year DFS. Together, we suggest that these findings support that socioeconomic and patient factors, instead of travel distance alone, impact HNC workup patterns.

122. **Metastatic Patterns of Non-Hodgkin's Lymphoma and Indications for Radiographic Diagnosis and Core Needle Biopsy**

Sairisheel Gabbireddy, MD, Morgantown, WV; Tyler J. Ostrowski, BS, Clifton Park, NY; Faraz Khan, MD, Albany, NY; Ananth Narayan, MD, Albany, NY; Paul Feustel, PhD, Albany, NY; Neil Gildener-Leapman, MD, Albany, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to accurately describe the radiographic characteristics of cervical lymph nodes in the evaluation of non-Hodgkin's lymphoma and how these characteristics compare to lymphadenopathy associated with head and neck squamous cell carcinoma.

Objectives: To define a set of radiologic characteristics in the evaluation cervical lymph nodes to help identify optimal candidates for core needle biopsy versus open surgical biopsy in the diagnosis of non-Hodgkin's lymphoma (NHL). **Study Design:** Retrospective single blinded evaluation of deidentified CT scans. **Methods:** CT neck scans of lymph nodes were read by blinded radiologists and described using radiographic characteristics of nodes. Quantitative statistical testing was used to calculate differences between the NHL cohort and a control squamous cell carcinomas (SCC) cohort. **Results:** Overall, 33 radiographic cases were reviewed, 18 NHL and 15 SCC. The most commonly involved lymph node basins in NHL were II (16), V and VI (15) versus I (10) and III (9) for SCC. When compared to the SCC control, the NHL group showed a higher a number of involved lymph nodes less

than 1cm ($p=0.007$), 1-2 cm ($p=0.003$), and greater than 2 cm ($p=0.006$) in size. The NHL group had significantly lower node RADS scores for texture ($p=0.030$) and total node RADS scores (difference of -2 ($p=0.059$; 95% CI: -3-0)). The NHL group showed a larger number of nodal basins involved with a difference of 5 ($p=0.001$; 95% CI: 2-8). NHL was also more likely to present with bilateral lymphadenopathy compared to SCC ($p=0.005$). Conclusions: There are several radiographic characteristics associated with cervical lymphadenopathy identified on CT scan that make a diagnosis of NHL more likely than SCC. Expanded studies on these characteristics could lead to greater confidence in defining the optimal candidate for in-office core needle biopsy versus open surgical biopsy.

123. **Hypoglossal Nerve Schwannoma Presenting as a Submandibular Mass**

Dana Goldenberg, BA, Hershey, PA; Guy Slonimsky, MD, Hershey, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize, diagnose and treat hypoglossal nerve schwannoma.

Objectives: To present a rare case of hypoglossal nerve schwannoma, the difficulties in identifying these lesions and the risks associated with surgical intervention. Study Design: Case report and literature review. Methods: We present a case of hypoglossal nerve schwannoma presented as a centrally necrotic mass in the submandibular space. We then review the incidence of hypoglossal nerve schwannomas, its presentation, diagnosis, treatment and complication. Results: We report and discuss a case of hypoglossal nerve schwannoma presented as a centrally necrotic mass in the submandibular space. Preoperative imaging and needle biopsy did not lead to a definitive diagnosis. At surgery, the lesion intimately involved the hypoglossal nerve necessitating meticulous dissection to preserve the nerve and its function. Postoperatively, the hypoglossal nerve function was found to be intact. Conclusions: Schwannomas are rare, slow growing, often benign, tumors of the Schwann cells of peripheral nerves. Overwhelmingly, schwannomas are found intracranially, most commonly affecting the vestibulocochlear nerve (CN VIII), but they may occur extracranially. However, extracranial schwannomas account for 25-35% of all benign head and neck tumors, most commonly originating the vagus nerve and the cervical sympathetic chain within the pharyngeal space. Schwannomas of the hypoglossal nerve (CN XII) are exceedingly rare, comprising only 5% of nonvestibular schwannomas. Careful surgical resection with hypoglossal nerve preservation is the mainstay of treatment.

124. **Total Thyroidectomy for Patients with Uncontrolled Hashimoto's Thyroiditis**

Dana Goldenberg, BA, Hershey, PA; Pallavi Kulkarni, BS, Hershey, PA; F. Jeffrey Lorenz, BS, Hershey, PA; Neerav Goyal, MD MPH FACS, Hershey, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that while Hashimoto's thyroiditis is most often managed medically with thyroid hormone replacement therapy, 10-20% of patients suffer persistent symptoms despite standard medical therapy. In these patients, hypothyroid symptoms are suspected to be a direct result of the autoimmune process itself, due to antibody mediated lymphocytic infiltration, rather than the hormonal deficit. For these euthyroid patients whose symptoms persist, total thyroidectomy has been shown to decrease symptom burden in a small, randomized control trial.

Objectives: To determine the effect of total thyroidectomy on hypothyroid symptoms in patients whose Hashimoto's thyroiditis is uncontrolled based on elevated anti-thyroperoxidase (anti-TPO) titers. **Study Design:** Retrospective cohort study. **Methods:** The TriNetX Research Network was queried using diagnosis codes for Hashimoto's thyroiditis, lab codes for anti-TPO antibody titers, and procedure codes for total thyroidectomy. An anti-TPO antibody titer greater than 17 IU/ml was defined as uncontrolled. Diagnosis codes were then used to identify symptoms, including weight gain, fatigue/malaise, depression, anxiety, constipation, and joint pain. The risk of each of the symptoms was stratified in this patient population within 1 year before and 1 year after the patient underwent thyroidectomy. **Results:** There were 1,770 patients from 40 HCOs, diagnosed with Hashimoto's thyroiditis who underwent total thyroidectomy. Of this cohort, 67.2% (n= 1,190) had anti-TPO titers greater than 17 IU/ml. Within those with uncontrolled antibodies, 49% had at least one persistent hypothyroid symptom. This cohort was 89% female and 11% male, with an average age of 42.6 years at the time of thyroidectomy. After treatment with thyroidectomy, patients with uncontrolled Hashimoto's experienced significant (P < 0.001) decreases in symptoms; unexplained weight gain (RR, 95% CI) (0.25, 0.19-0.34), malaise and fatigue (0.31, 0.28-0.37), depression (0.45, 0.39-0.52), anxiety (0.39, 0.33-0.45), constipation (0.32, 0.26-0.40), hyperlipidemia (0.41, 0.35-0.49), and joint pain (0.35, 0.30-0.40). **Conclusions:** Hashimoto's thyroiditis (HT) is managed medically with thyroid hormone replacement therapy. Surgery is typically reserved for patients who are refractory to medical therapy. Twenty percent of patients suffer persistent symptoms despite adequate medical therapy. In patients with symptomatic, uncontrolled Hashimoto's thyroiditis patients, with elevated anti-TPO titers, thyroidectomy decrease symptoms, including malaise and fatigue, depression, anxiety, constipation, hyperlipidemia, and joint pain.

125. A Prospective Evaluation of Neck and Shoulder Function following Early Stage Human Papillomavirus Associated Oropharynx Cancer Treatments

Arushi Gulati, BS, San Francisco, CA; Karolina Plonowska-Hirschfeld, MD, San Francisco, CA; Sagar Kansara, MD, San Francisco, CA; Edgar Ochoa, MD, San Francisco, CA; Mary Xu, MD, Philadelphia, PA; William Ryan, MD, San Francisco, CA

Educational Objective: To identify short and long term changes in shoulder and neck function following treatment for human papillomavirus associated oropharynx squamous cell carcinoma and to compare changes in shoulder and neck function across treatments.

Objectives: Compare post-treatment neck and shoulder function between human papillomavirus associated oropharynx squamous cell carcinoma (HPV+OPSCC) treatments. **Study Design:** Prospective, repeated measures study. **Methods:** HPV+OPSCC patients completed the Neck Dissection Impairment Index (NDII) pre-treatment and three months and one year post-treatment. The NDII assesses 10 neck and shoulder functions scored 0-5 (total score 0-100) with higher scores suggesting better function. **Results:** 106 patients underwent: surgery alone (SA, n=46, 43%), surgery with adjuvant radiation +/- chemotherapy (S+[C]XRT, n=18, 17%), or radiation +/- chemotherapy ([C]XRT, n=42, 40%). cTN classification and pretreatment NDII scores did not differ between groups. SA patients reported worsened three month post-treatment vs pre-treatment self-care (4.6 vs 5.0), lifting light (4.6 vs 5.0) and heavy (4.2 vs 4.8) objects, overhead reach (4.5 vs 4.9), activity

(4.5 vs 4.9), socialization (4.7 vs 4.9), recreation (4.6 vs 4.9), and overall score (86.8 vs 95.3) (all $p < 0.05$). One year post-treatment scores ($n=34$) were no different than pretreatment in all domains. S+[C]XRT patients reported worsened three month vs pre-treatment stiffness (4.0 vs 4.8), lifting heavy objects (3.8 vs 4.9), overhead reach (4.2 vs 4.9), socialization (4.6 vs 5.0), recreation (4.4 vs 4.9) and overall score (82.4 vs 96.0) (all $p < 0.05$). One year post-treatment scores ($n=13$) were no different than pretreatment in all domains. [C]XRT patients reported worsened three month vs pre-treatment difficulty lifting heavy objects (4.3 vs 4.7) and recreation (4.3 vs 4.7). One year posttreatment scores ($n=21$) were no different than pretreatment in all domains. Conclusions: HPV+OPSCC patients may experience mild shoulder/neck dysfunction three months after treatments that usually resolves by one year, independent of treatment modality.

126. Practice Patterns of Speech Language Pathologists in Treatment of Head and Neck Cancer Related Trismus

Arushi Gulati, BS, San Francisco, CA; Erika Stephens, BA, San Francisco, CA; Cara Evans, CCC-SLP MS, San Francisco, CA; Andrea Park, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify variations in speech language pathologist practice patterns and resource availability for treatment of trismus.

Objectives: To survey speech language pathologists (SLPs) nationally to better understand current therapies provided to patients with radiation related trismus and to identify patient and provider challenges with these treatments. Study Design: Cross-sectional multi-institutional study. Methods: Current SLPs providing care to trismus patients completed an anonymous online survey. Topics queried included timing and frequency of trismus therapy, type of therapy, perceived patient compliance, and barriers to compliance or access to therapy. Results: Of the 96 respondents, the majority worked in an inpatient setting ($n=52$, 52%) and/or an outpatient clinic ($n=77\%$, 80%) and mean time in practice was 14.6 +/- 10.4 years. Most respondents ($n=61$, 64%) initiated therapy in at least some or instances prior to start of radiation treatment and treated patients at least weekly ($n=70$, 73%). The most commonly used treatments included commercially available devices ($n=74$, 77%), myofascial release ($n=55$, 57%), and stick stacking or hand stretching (both $n=53$, 55%). Of practitioners who used trismus devices, 62% ($n=46$) found them somewhat or extremely difficult to obtain. Most frequently cited barriers to device use included device cost ($n=62$, 84%) or insurance coverage ($n=59$, 80%). Types of therapy used did not differ by academic vs. non-academic practice setting (all $p > 0.05$). Conclusions: Trismus therapy treatment patterns vary between individual SLPs and may be impacted by access to commercially available devices. Standardization of treatment may facilitate improved evaluation of trismus treatment outcomes.

127. Electromyography Findings in Radiation Induced Hypoglossal Nerve Injury

Randall J. Harley, BS, Pittsburgh, PA; Michael C. Munin, MD, Pittsburgh, PA; Jonas T. Johnson, MD, Pittsburgh, PA; Marci L. Nilsen, PhD RN, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the different etiologies of radiation induced hypo-

glossal nerve injury and genioglossus muscle dysfunction.

Objectives: Studies in electromyography (EMG) have provided key insight into neuromuscular dysfunction in the setting of cancer treatment. In studies related to brachial and lumbosacral plexopathies, myokymia has been identified as an indicator of radiation induced neuropathy and fibrillation potentials have been identified as an indicator of cancer recurrence. This clinical insight is particularly important among head and neck cancer survivors who can present with late onset neuromuscular issues such as dysarthria and dysphagia. The aim of this study is to characterize the EMG features of radiation induced hypoglossal nerve injury among head and neck cancer survivors. **Study Design:** Prospective case series. **Methods:** A total of 10 patients with new onset dysarthria and/or oropharyngeal dysphagia were recruited from a tertiary academic institution between February and September 2021. All patients were previously treated with radiation therapy for head and neck squamous cell carcinoma. Participants were under annual surveillance and displayed no evidence of operative injury to the hypoglossal nerve. **Results:** All patients included in this study presented with unilateral tongue immobility and atrophy, without radiographic or clinical evidence of cancer. Median symptom free interval was 13.5 years (range 2-25 years). Myokymia was present in 4 out of 10 patients and fibrillation potentials were present in 4 out of 10 patients, and 1 subject displaying both fibrillation and myokymia. Three out of 10 patients had normal hypoglossal nerve function. **Conclusions:** In head and neck cancer, fibrillation potentials and myokymia represent two etiologies of radiation induced nerve injury. Furthermore, radiation therapy can lead to dysarthria and oropharyngeal dysphagia through neurologic and non-neurologic mechanisms.

128. **Characteristics and Sequela of Self-Inflicted Facial Gunshot Wounds: A Systematic Review**

Kayla B. Hicks, MD, Chapel Hill, NC; Zainab Farzal, MD MPH, Chapel Hill, NC (Presenter); Christina Orantes, BA, Chapel Hill, NC; Spencer Scott, BS, Chapel Hill, NC; Trevor G. Hackman, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to identify trends in demographics for facial GSWs, common injury patterns and surgical interventions.

Objectives: Self-inflicted gunshot wounds (GSWs) have a large public health burden. The objective of this review was to analyze demographics, injury patterns, and outcomes of self-inflicted facial gunshot wounds. **Study Design:** Systematic review. **Methods:** A systematic search was performed using the PubMed database in accordance with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines querying publications from 1980 to 2022. **Results:** Thirteen studies met inclusion criteria. These studies comprised 16,137 patients, including 85.6% males with an average age of 42.9 years. The most common weapon was a handgun, followed by shot-gun, rifle, and "other" long barrelled weapons. Many individuals were under the influence of alcohol (48.7%) or drugs (35.4%) at the time of injury, or carried an underlying psychiatric diagnosis (44.9%). GSWs most often resulted in injury to multiple facial bones, most commonly the mandible followed closely by the maxilla; surgical intervention included open reduction and internal fixation in most cases, and soft tissue reconstruction including locoregional and/or microvascular free flaps. 26.1% of patients required tracheostomy. Mean hospital length of stay was 13.1 days. Mortality for this sample was 51.5%. **Conclusions:** As injury and death from firearms becomes more preva-

lent, awareness of effective intervention before and after injury becomes more important. This includes early identification and appropriate treatment for those at risk for self-inflicted GSWs, sensible firearm legislation to limit access to those in crisis, and development of best practices for medical and surgical intervention post-injury.

129. Tobacco Use and Outcomes in Oral Cavity Cancer: Are Female Nonsmokers at a Prognostic Advantage?

Sara B. Hobday, BA, Philadelphia, PA; Erin R. Cohen, MD, Miami, FL; Robert M. Brody, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should understand the prognostic implications of smoking history in the management and prognosis of oral cavity cancer.

Objectives: To compare demographic, clinical, and pathologic characteristics between smoking and nonsmoking patients with oral cavity cancer and describe what effect, if any, these differences have on patient outcomes. Study Design: Retrospective cohort study of patients treated surgically for oral cavity cancer at a single tertiary care center. Methods: Chart review and data abstraction were performed for patients who met inclusion criteria. Patients with a smoking history of ten pack years or less were considered nonsmokers, while those with over ten pack years comprised the smoker group. Results: Of the 565 patients included in the study, 262 (46.4%) were smokers. Compared to nonsmokers, patients in the smoking group had higher rates of cervical nodal disease and lymphovascular invasion. Additionally, patients with a smoking history were more likely to undergo contralateral neck dissection. One hundred and fifty-five patients in our cohort were classified as female nonsmokers. When compared to male nonsmokers, female nonsmokers demonstrated an older average age at diagnosis. When female nonsmokers were compared to female smokers, female nonsmokers were more likely to have a Charlson Comorbidity Index of 0. No differences in overall survival or recurrence free survival were noted between smokers and nonsmokers. On multivariable Cox regression, higher T stage, presence of perineural invasion, and treatment with adjuvant radiation were associated with decreased overall survival. Conclusions: While smoking is an established risk factor for the development of oral cavity cancer, smoking status does not have a demonstrable effect on outcomes in these patients.

130. Disparities in Care and Prognosis of Sinonasal and Middle Ear Malignancies Using the Social Vulnerability Index and SEER Database

Achilles A. Kanaris, BS, Chicago, IL; David Jun Fei-Zhang, BA, Chicago, IL; Daniel Chelius, MD, Houston, TX; Anthony Sheyn, MD, Memphis, TN; Jeff Rastatter, MD MS, Chicago, IL

Educational Objective: Through highlighting the utility of the Social Vulnerability Index, participants will recognize and differentiate between the influences of various measures of social determinants of health on outcomes of sinonasal and middle ear malignancies.

Objectives: To examine several measures of social determinants of health and their summative influence on outcomes in nasal cavity, sinus, and middle ear malignancies (NSEM). Study Design: Retrospective cohort study using Surveillance,

Epidemiology, and End Results (SEER) and Social Vulnerability Index (SVI) databases. Methods: 14,092 sinonasal and middle ear malignancy patients were extracted from 1975-2017 in SEER. SVI scores were matched based on county of residence at time of diagnosis and assessed by univariate regressions for care (months of followup/surveyed) and prognosis (months survival) disparities across socioeconomic status, minority language status, household composition, housing transportation factors, and their total composite by SVI scores. Results: Increasing overall social vulnerability, measured by total SVI, showed significant decreases in months of followup observed for many primary sites ($p < 0.01$ at most) and histopathologic subtypes ($p < 0.037$ at most), ranging from 8.73-69.75% decreases in mean lengths of care when comparing the lowest to highest vulnerability cohorts. Similarly, increasing total SVI showed significant decreases in months survival across many primary sites ($p < 0.023$ at most) and histopathologic subtypes ($p < 0.037$ at most), ranging from 19.53-73.36% decreases in the mean survival period when comparing the lowest to highest vulnerability cohorts. Increasing SVI theme subscores contributed significantly to these trends in months surveyed and survival, with socioeconomic status, minority language status, household composition, and housing transportation showing differential magnitudes of impact across sites and subtypes. Conclusions: Our results show significant decreases in NSEM patient care and prognosis with overall social vulnerability and identify which SVI themes have the largest impact on these disparities.

131. **Proton Beam Therapy for Sinonasal Malignancies - A National Perspective**

Suat Kilic, MD, Cleveland, OH; Sarah S. Kilic, MD, Cleveland, OH; Yang Kailin, MD PhD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to summarize the role of proton beam therapy in treating sinonasal malignancies and identify patients that are less likely to be treated with this newer modality.

Objectives: To determine the type of patients receiving proton beam therapy (PBT) for sinonasal malignancies in the United States, and how they differ from patients receiving traditional photon based radiotherapy. **Study Design:** Cross-sectional analysis. **Methods:** Sinonasal malignancies in the National Cancer Database (2004-2018) that received radiotherapy were identified. Patients were classified based on the radiation modality received. Demographic, clinical, and socioeconomic factors were compared between patients receiving proton beam radiation and traditional, photon based radiation treatment. **Results:** Of the 13,040 cases identified, 564 (4.3%) received PBT, and 12,136 (93.1%) received traditional, photon based radiotherapy. There was an increase in the utilization of PBT from year to year ($p < 0.05$; 1.2% of cases in 2004, 14.4% of cases in 2018). East-South-Central region patients were less likely to be treated with PBT (0.4% of cases vs. 4.4% in other regions, $p < 0.05$). Black patients were less likely to receive PBT compared to Caucasian patients (3.0% vs. 4.4%, $p < 0.05$). Uninsured (1.3%), Medicare (3.4%), and Medicaid (4.3%) patients were less likely to receive PBT when compared with private insurance (5.6%) ($p < 0.05$). Olfactory neuroblastomas (8.9%), undifferentiated carcinomas (10.7%), and adenoid cystic carcinomas (6.9%) were more likely to be treated with PBT compared to squamous cell carcinomas (2.9%) ($p < 0.05$). Higher Charlson-Deyo comorbidity score, lower income, rural location, and non-academic treatment facility were associated with a lower likelihood of receiving PBT. **Conclusions:** The use of PBT to treat sinonasal malignancies is increasing. Sever-

al factors are associated with a decreased likelihood of receiving PBT, suggesting disparities in access to this modality.

132. Increased Incidence of Head and Neck Cancer in Areas with High Levels of Income Inequality in Our County

Ian Kim, PhD, Los Angeles, CA; Matthew Lin, BS, Los Angeles, CA; Harrison J. Ma, BS, Los Angeles, CA; Liyang Tang, MD, Loma Linda, CA; Kevin Hur, MD, Los Angeles, CA; Niels C. Kokot, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to have a better understanding of the impact of income inequality on spatial variations of head and neck cancer incidence in our county.

Objectives: Income inequality is associated with numerous negative health outcomes. Evidence suggests that ecological level socioenvironmental factors may increase risk for head and neck cancer (HNC). This study investigates whether measures of income inequality are associated with HNC at the census tract level. Study Design: Cross-sectional. Methods: Incident HNC cases diagnosed between 1988 and 2018 in our county were included in the study. Socioenvironmental data were obtained from the American Community Survey at the census tract level. Geocoded HNC cases were evaluated for spatial clustering using the Getis-Ord Gi statistic. A spatial lag model was developed to examine the association between income inequality and HNC incidence, adjusted for socioeconomic (SES) index, rural urban status, and distributions of age, gender and race/ethnicity. Results: In the spatial distribution of HNC incidence, large clusters were found in 3 areas. Areas with greater income inequality, lower SES, increased rurality, older age, and greater proportion of female gender were significant predictors of increased HNC incidence. The detrimental impact of lower SES was greater in tracts with older median ages. Distributions of race and ethnicity were not significantly associated with HNC incidence. Conclusions: Significant spatial clusters of high incidence rates in our require further investigation to improve early HNC detection and survivorship. A medium sized ($d = 0.2$) reduction in income inequality could decrease annual HNC incidence by approximately 3 cases per 100,000 residents. Spatial analysis can identify high disparity areas and inform targeted HNC control programming.

133. Celiac Disease as a Risk Factor for Hypocalcemia Following Parathyroidectomy: A TriNetX Study

Pallavi Kulkarni, BS, Hershey, PA; F. Jeffrey Lorenz, BS, Hershey, PA; Dana Goldenberg, BA, Hershey, PA; Neerav Goyal, MD MPH, Hershey, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the potential for patients with celiac disease to have an increased risk of developing hypocalcemia following parathyroidectomy.

Objectives: Patients with celiac disease (CD) present with an increased susceptibility for hypocalcemia resultant from malabsorption. Parathyroidectomy poses a risk for developing hypocalcemia, which usually resolves with treatment within a few days. The goal of this study is to investigate the relationship between CD and risk of hypocalcemia in patients post-parathyroidectomy. Study Design: Retrospective cohort study using the TriNetX Research Network. Methods: The TriNetX Research Network was utilized to identify patients with a diagnosis of CD

and primary hyperparathyroidism treated with parathyroidectomy, excluding patients that had undergone bariatric surgery or had a diagnosis of end stage renal disease. Individuals taking calcium supplements within the year prior to surgery were also excluded. Patients were matched for age and gender. Incidence of hypocalcemia was compared between patients with and without a diagnosis of CD. Results: 26,770 patients diagnosed with primary hyperparathyroidism treated with parathyroidectomy were identified. Of this group, 0.16% (n=42) had CD. Within the CD group, the average age was 59.2 and 85% were female. Individuals in this cohort were more likely to have a short term (0-6 months) (RR, 95% CI, P) (2.50, 1.45-4.30, .0017) and permanent (6 months - 1 year) (9.50, 5.47-16.49, <0.0001) diagnosis of hypocalcemia in comparison to patients without CD. These results were not significant after matching patients for age and gender. Conclusions: In this study, we show that patients with CD have an increased risk of short term and permanent hypocalcemia post-parathyroidectomy. Results may have not been significant after matching patients due to the size of the CD cohort. This can advise hypocalcemia surveillance and prevention for patients with CD following surgery.

134. Celiac Disease as a Risk Factor for Hypocalcemia following Thyroidectomy: A TriNetX Study

Pallavi Kulkarni, BS, Hershey, PA; F. Jeffrey Lorenz, BS, Hershey, PA; Dana Goldenberg, BA, Hershey, PA; Neerav Goyal, MD MPH, Hershey, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize that patients with celiac disease could be at higher risk of developing hypocalcemia following thyroidectomy.

Objectives: Patients with celiac disease (CD) present with increased susceptibility for hypocalcemia resultant from malabsorption. Thyroidectomy poses a risk for developing hypocalcemia, which usually resolves with treatment within a few weeks. The goal of this study is to investigate the relationship between CD and risk of hypocalcemia in patients post-thyroidectomy. Study Design: Retrospective cohort study using the TriNetX Research Network. Methods: The TriNetX Research Network was utilized to identify patients with a diagnosis of CD and had undergone total or subtotal thyroidectomy, excluding patients that had undergone bariatric surgery or had a diagnosis of end stage renal disease. Individuals taking calcium supplements within the year prior to surgery were also excluded. Patients were matched for age and gender. Incidence of hypocalcemia was compared between patients with and without a diagnosis of CD. Results: 26,809 patients who had undergone either total or subtotal thyroidectomy were identified. Of this group, 0.30% (n=81) had CD. Within the CD group, the average age was 44.3 and 81% were female. Individuals in this cohort were more likely to have a short term (0-6 months) (RR, 95% CI, P) (1.51, 1.15-1.98, 0.0065) and permanent (6 months-1 year) (2.63, 1.47-4.72, 0.0012) diagnosis of hypocalcemia in comparison to patients without CD. These results were not significant after matching patients for age and gender. Conclusions: In this study, we show that patients with CD have an increased risk of short term and permanent hypocalcemia post-thyroidectomy. Results could be insignificant after matching for demographics due to smaller size of the CD cohort. This can advise hypocalcemia surveillance and prevention for patients with CD following surgery

135. Risk Factors for Deep Venous Thrombosis (DVT) in Head and Neck Cancer Patients Who Undergo Free Tissue Transfer: A National

Surgical Quality Improvement Program (NSQIP) Analysis

Kevin C. Lee, MD DDS, New York, NY; Nicholas A. Waring, BS, New York, NY; Victoria X. Yu, MD, New York, NY; Scott H. Troob, MD, New York, NY; Anuraag S. Parikh, MD, New York, NY

Educational Objective: After this presentation, participants should be able to understand risk factors and consequences of postoperative deep venous thrombosis (DVT) in head and neck cancer (HNC) patients undergoing free tissue transfer.

Objectives: Patients with HNC have increased risk of DVT. In this analysis, we sought to identify independent predictors of postoperative DVT in HNC patients undergoing free tissue transfer. **Study Design:** This is a cross-sectional study. **Methods:** We use data from the National Surgical Quality Improvement Program database from 2010 through 2020. The sample included all HNC patients submitted to free flap reconstruction. The study outcome was the presence of a DVT. Univariate analyses were performed using chi squared and independent t-tests. A multiple logistic regression model was created using all significant univariate predictors. **Results:** 3,960 patients were identified, of which 53 (1.3%) experienced a postoperative DVT. The only comorbidity associated with DVT was COPD (RR=2.7; $p<0.01$). Patients who developed DVTs had longer operative times (623.5 vs 564.4 min; $p=0.02$). Hospitalizations longer than 10 days (RR=1.9; $p=0.02$) and 30 days (RR=5.8; $p<0.01$) were associated with an increased risk of DVT. After controlling for confounders, COPD ($p<0.01$) and operative time ($p=0.02$) were independently associated with DVT risk. The presence of a DVT was found to increase the relative risk of postoperative PE (RR=16.5; $p<0.01$), MI (RR=5.2; $p<0.01$), readmission (RR=2.1; $p<0.01$), and non-home disposition (RR=2.4; $p<0.01$). **Conclusions:** Postoperative DVTs were uncommon among this patient population. Prolonged operative time was an independent risk factor for DVT. The presence of a DVT was associated with increased risk of other complications.

136. A Propensity Matched Score Analysis of Profit Status's Association with Thyroidectomy Outcomes and Cost of Care

Mehdi Skender Lemdani, BA, Newark, NJ; Hannaan S. Choudhry, BA, Newark, NJ; Rushi Patel, BS, Newark, NJ; Prayag Patel, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to determine the impact of for profit incentives on thyroidectomy costs, charges, and outcomes.

Objectives: Despite increasing discussion on profit's role in healthcare, there is little literature on the impact of for profit hospital ownership on otolaryngological care. This study compares nonprofit and for profit private hospitals to determine if there are differences in postoperative outcomes and charges for patients undergoing a thyroidectomy. **Study Design:** Retrospective database review. **Methods:** The National Inpatient Sample (NIS) was queried for patients who underwent thyroidectomies from 2016 to 2017. Primary outcomes were compared between nonprofit and for profit private hospitals while accounting for discharge weight, demographics, comorbidities, and hospital characteristics via propensity score matching. **Results:** Of 6,181 (30,905 weighted) cases of thyroidectomies queried, 5,339 (86.4%) were performed at nonprofit hospitals and 842 (13.6%) at for profit hospitals. After propensity score matching, mortality rates were similar between non-profit and for profit hospitals (OR 0.994, 95% CI 0.989 - 0.999, $p = 0.022$). For profit hospitals

discharged a similar proportion of patients home as nonprofit hospitals (OR 1.158, 95% CI 0.886 - 1.514, $p = 0.282$). Length of stay was slightly longer at for-profit hospitals (mean [SD]: 5.64 [5.68] vs 5.45 [5.613], $p < 0.001$). Total hospital charges were higher at for profit hospitals (mean +/- SD: \$110,912.93 +/- 136,502.50 vs. \$156,477.91 +/- 147,494.37, $p < 0.001$) although, after adjusting, total costs were lower per patients (\$21,446.66 +/- \$21,391.99 vs. \$27,617.12 +/- \$27,049.18, $p < 0.001$). Conclusions: This study suggests that thyroidectomies have a slightly lower mortality rate and longer length of stay at for profit hospitals. While total charges are higher at for profit hospitals, the cost per patient is significantly lower in these hospitals.

137. Characteristics Associated with Undergoing Nonsurgical Treatment among Head and Neck Cancer Patients Living in Our County

Matthew E. Lin, BS, Los Angeles, CA; Ian Kim, PhD, Los Angeles, CA; Liyang Tang, MD, Loma Linda, CA; Kevin Hur, MD, Los Angeles, CA; Niels C. Kokot, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to learn about the characteristics of head and neck cancer patients in our county and variables that affect radiotherapy and chemotherapy decision making.

Objectives: To identify demographic, socioeconomic, and clinical characteristics predictive of nonsurgical treatment for head and neck cancer (HNC) patients. Study Design: Retrospective analysis of our county's Surveillance, Epidemiology, and End Results (SEER) data. Methods: All HNC patients from the 1988-2018 our county's SEER database were included. Patient demographics, socioeconomic status, tumor stage, and other medical history were collected. Multivariate logistic regression was used to examine factors associated with primary or adjuvant radiation therapy and/or chemotherapy. Results: A total of 5,111 HNC patients were included. Relative to Hispanic patients, non-Hispanic Asian patients were more likely (OR = 1.52, 95% CI = 0.04-0.80, $p = 0.03$) to undergo radiation therapy. However, Asian patients were less likely to undergo chemotherapy (OR = 0.36, 95% CI = 0.18 - 0.54, $p = 0.0476$). Older age was associated with a significantly higher likelihood of radiation therapy in White patients with lower SES; however, older age was associated with a significantly lower likelihood of having radiation therapy in White patients with higher SES. In non-White patients, the association between SES and the age associated likelihood of radiation therapy was reversed. Relative to those without insurance, patients with private (OR = 2.43, 95% CI = 1.60 - 2.36, $p = 0.003$) or public (OR = 2.50, 95% CI = 1.67-3.33, $p = 0.003$) insurance were more likely to undergo radiotherapy and/or chemotherapy. Conclusions: Racial, socioeconomic, and clinical differences exist between patients who undergo nonsurgical treatment and those who do not. Understanding the etiology of these differences will help improve the quality of care in this population.

138. Mycobacterium Avium Intracellulare Masquerading as Head and Neck Cancer

Joseph Shen Lu, BS, Philadelphia, PA; Neel R. Sangal, MD, Philadelphia, PA; Steven Cannady, MD, Philadelphia, PA; Justin Shinn, MD, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that although timely and accurate diagnoses of head

and neck cancer is critically important, appropriate apprehension and clinical scrutiny are also necessary to avoid false diagnoses, and multidisciplinary care facilitates the diagnosis, management, and care of both.

Objectives: *Mycobacterium avium intracellulare* (MAI) can cause head and neck infections in immunocompromised patients, but rarely in patients with functioning immune systems. We report a case of MAI infection of an immunocompetent patient with concern for advanced malignancy. **Study Design:** Case report. **Methods:** Reviewed the clinical presentation and pertinent findings of a 64 year old gentleman with a significant smoking history and three months of neck pain and dysphagia. **Results:** A 64 year old male with a 50 pack year smoking history presented with a dominant, mobile level II neck mass adjacent to several smaller fixed lymph nodes. On endoscopy and CT imaging, there was right tonsillar fullness, oro and hypopharyngeal mucosal thickening, and generalized pharyngeal edema without ulcerative lesions. Additional CT revealed a 3 cm multinodular enhancing lesion in level Ib and nonspecific nodules and ground glass opacities within his lung. Given the concern for mucosal cancer, he underwent airway evaluation where numerous intraoperative frozen section analyses were negative for malignancy. On final pathology, there remained no evidence of malignancy with diffuse inflammation and significant necrosis found on FNA. HIV, TB, and immune testing as well as TB and AFB sputum cultures were negative; however, tracheal aspirate grew MAI after the patient was discharged from the hospital, although he improved after initiating systemic antibiotics and steroids. He improved rapidly after initiating systemic therapy guided by infectious disease and completed treatment with azithromycin, rifampin, and ethambutol. **Conclusions:** This is the first reported case of MAI lymphadenopathy with oropharyngeal involvement in a non-immunocompromised patient, a unique and challenging diagnostic consideration.

139. A Survival Analysis and Identification of Prognostic Factors and Ideal Treatment Modalities for Merkel Cell Carcinoma of the Head and Neck Using the SEER Database

Megan Lyden, BS, Washington, DC; Randall Harley, BS, Pittsburgh, PA; Leandro Socolovsky, MD, Washington, DC; Earl Harley, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss prognostic factors for head and neck Merkel cell carcinoma (HNMCC) as well as the impact of radiotherapy on patient survival outcomes.

Objectives: Analyze the association between demographic factors, tumor characteristics, and treatment modalities on overall survival (OS) and disease specific survival (DSS) of HNMCC. **Study Design:** Retrospective database study. **Methods:** The 2000-2019 Surveillance, Epidemiology, and End Results (SEER) dataset was queried for primary, histologically confirmed HNMCC. Entropy balancing was used to balance baseline covariates between radiation treatment groups. Survival was estimated using weighted multivariable cox proportional hazards model. **Results:** 2,345 patients met inclusion criteria. Negative predictors for DSS were age at diagnosis (HR 1.03, 95% CI: 1.02-1.04, $p < 0.001$), primary site of scalp and neck (HR 1.43, 95% CI: 1.13-1.81, $p = 0.003$) or lip (HR 1.52, 95% CI: 1.02-2.27, $p = 0.041$), and regional nodal metastasis (HR 6.16, 95% CI: 3.48-10.93, $p < 0.001$). OS had the same negative predictors. Female sex was a positive predictor for DSS (HR 0.41, 95% CI: 0.31-0.54, $p < 0.001$). Radiotherapy in patients with regional nodal metastasis had greater DSS (HR 0.60, 95% CI: 0.40-0.91, $p = 0.016$) and

OS (HR 0.60, 95% CI: 0.44-0.83, $p=0.002$). Surgery improved OS (HR 0.66, 95% CI: 0.54-0.80, $p<0.001$). Chemotherapy worsened DSS (HR 2.00, 95% CI: 1.49-2.69, $p<0.001$) and OS (HR 1.64, 95% CI: 1.32-2.05, $p<0.001$). DSS at 1, 3, and 5 years was 88.30%, 76.36%, and 72.87%, respectively. OS at 1, 3, and 5 years was 76.02%, 52.44%, and 41.50%, respectively. Conclusions: Age, sex, primary site, tumor extension, and nodal involvement are important prognostic factors for HNMCC. Patients with regional nodal metastasis who receive radiotherapy have a 40% improved survival compared to no radiotherapy. Despite low OS rates, DSS remained favorable, indicating high frequencies of death from intercurrent disease and age.

140. Evaluating the Impact of Hemodynamic Support Measures on Head and Neck Free Flap Outcomes: A Large Database Study

Eric Van Mastrodonardo, MD, Philadelphia, PA; Joseph Lu, BS, Philadelphia, PA (Presenter); Zachary Elliott, BS, Greenville, NC; Alexander Knops, MD, Philadelphia, PA; Zachary Urdrag, MD PhD, Philadelphia, PA; Joseph Curry, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the effects of perioperative vasopressor and blood transfusion interventions for hemodynamic support in ablative head and neck surgery (HNS) with free tissue transfer (FTT) reconstruction.

Objectives: 1) analyze the effects of perioperative blood transfusions and vasopressors on 30 day surgical complications and 1 year mortality after FTT; and 2) identify predictors of need for blood transfusions or vasopressors Study Design: Retrospective population level study. Methods: TriNetX (TriNetX LLC, Cambridge, USA), a large population based database, was queried to identify subjects that underwent HNS with FTT requiring perioperative (intraoperative to postoperative day 5) vasopressors or blood transfusions. Primary dependent variables of interest were 30 day surgical complications and 1 year mortality. Propensity score matching was used to control for population differences, and regression analysis was used to identify comorbidities associated with perioperative vasopressor or transfusion requirements. Results: A total of 7,631 patients were identified as having HNS with FTT. Malnutrition was a risk factor associated with perioperative transfusion (OR: 1.30, CI: 1.10, 1.54) and vasopressor requirement (OR: 4.58, CI: 3.07, 6.85). Perioperative blood transfusion ($n=941$) was associated with increased risk of wound dehiscence (odds ratio [OR]: 1.49, 95% confidence interval [CI]: 1.11, 2.00), surgical site fistula (OR: 2.71, CI: 1.46, 5.05), and FTT failure (OR: 2.00, CI: 1.28, 3.12). Perioperative vasopressor ($n=197$) use was not associated with any surgical complications. Both perioperative blood transfusion (OR: 1.28 CI: 1.01, 1.63) and vasopressor (OR: 2.36 CI: 1.43, 3.90) requirements were associated with significantly increased risk of mortality at 1 year postoperatively. Conclusions: Preoperative malnutrition was associated with perioperative transfusion and vasopressor requirements. Perioperative blood transfusion was associated with increased risk of surgical complications while perioperative vasopressor use was not associated with surgical complications. Both interventions were associated with increased 1 year mortality risk.

141. Analyzing County Level Social Vulnerabilities of Head Neck Melanomas in the United States

Lillian McCampbell, BS, Memphis, TN; David Jun Fei-Zhang, BA, Chicago, IL; Daniel Chelius, MD, Houston, TX; Jeff Rastatter, MD,

Chicago, IL; Anthony Sheyn, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) utilize the Social Vulnerability Index as a comprehensive tool for assessing a wide variety of social determinants of head neck melanoma care prognostic disparities on a national scale; 2) quantifiably assess the interrelationships between a wide range of social determinant themes with considerations of sociodemographic geographical contexts; and 3) understand how to combine heterogeneous, large databases in order to analyze the statistical trends between measured factors of social determinants (represented by the Social Vulnerability Index) and patient clinical characteristics.

Objectives: Studies addressing social determinants of health (SDH) in head neck melanomas (HNM) have only assessed incidence with increasing socioeconomic status. None have investigated a wider scope of SDH or their summed influence on affecting HNM prognosis and followup care. **Study Design:** This retrospective cohort study analyzed 374,138 HNM in adults from 1975-2017 from the NCI-Surveillance, Epidemiology, and End Results Program (NCI-SEER) database. **Methods:** With patients from the NCI-SEER database, Social Vulnerability Index (SVI) scores were matched to county of residence upon diagnosis. Univariate regressions were performed on care (i.e., months of follow p/surveyed) and prognosis (i.e. months survival) variables across various SDH represented by SVI scores of socioeconomic status, minority and language status, household composition, housing and transportation, and their total composite. **Results:** With increasing overall SVI score, which indicates increasing social vulnerability, months of followup showed significant decreases ranging from 0.04%-27.63% compared to the lowest vulnerability groups, with the highest differences in nodular melanomas and the lowest with malignant melanomas in giant pigmented nevi. Similarly, months survival significant decreases ranged from 0.19%-39.84% compared to the lowest SVI scores, with the highest difference in epithelioid cell melanomas and the lowest in amelanotic melanoma. Comprising this overall score trend, decreases with socioeconomic status, minority language status, household composition, and housing transportation contributed differentially per disease class. **Conclusions:** Our data highlight significant negative trends in HNM prognosis and care with higher total social vulnerability while showing which SDH themes quantifiably contribute more to these differences.

142. NSQIP Outcomes of Superficial Parotidectomy with or without Facial Nerve Dissection: The Case for Extracapsular Dissection

Michael Patrick McWilliams, BA, Richmond, VA; Emily Walzl, MS, Richmond, VA; Evan Reiter, MD, Richmond, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss differences in outcomes, including operative time and postoperative course, between superficial parotidectomy with or without facial nerve dissection.

Objectives: To compare outcomes, including operative time, length of postoperative stay and complication rates of patients with benign neoplasms undergoing superficial parotidectomy with or without facial nerve dissection, the latter a surrogate for extracapsular dissection technique. **Study Design:** Retrospective cohort (database) review. **Methods:** Retrospective review of the American College of Surgeons National Surgical Quality Improvement Project (NSQIP) database providing

30 day postop outcome data from 707 sites nationwide. Inclusion criteria were primary diagnosis of benign salivary neoplasm, age 18-85 years, primary procedure superficial parotidectomy either with [CPT 42415 (SPwFND)] or without (CPT 42410 (SPwoFND)) facial nerve dissection between 2012-2019. We analyzed demographics, operative time, length of stay, perioperative complications, readmission, and reoperation rates between the two procedure groups. NSQIP contained no information on postoperative facial paralysis or estimated blood loss. Results: 2651 patients underwent SPwFND while 764 underwent SPwoFND. Operative time was shorter (111.59 +/- 63.417) for SPwoFND than for SPwFND (135.05 +/- 64.313, $p < 0.0001$). Fewer patients undergoing SPwoFND required overnight stay than those undergoing SPwFND (41.5% vs 59.4%, $p < 0.001$). There were no significant differences between rates of reoperation, unplanned readmission, or perioperative complications between the groups. Conclusions: SPwoFND nerve dissection had a shorter operative time and led to fewer postoperative overnight stays than SPwFND, with no significant difference in rates of reoperation, unplanned readmission, or perioperative complications. This suggests that for appropriately selected patients, SPwoFND may be a comparable treatment option with the benefit of lower resource utilization than SPwFND.

143. Morbidity of Midline Mandibulotomy for Resection of Oral Cavity and Oropharyngeal Tumors

Sifon Ndon, MD, San Francisco, CA; Chase Heaton, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the morbidity associated with use of a midline mandibulotomy for surgical resection of oral cavity and oropharyngeal tumors.

Objectives: We sought to ascertain whether the use of a midline mandibulotomy for improved surgical access to oral cavity and oropharyngeal tumors confers an increased risk of postoperative complications, particularly in patients who have previously been treated for head and neck malignancies. **Study Design:** Retrospective review. **Methods:** Patients who underwent a midline mandibulotomy for resection of oral cavity or oropharyngeal tumors at a single institution from 2012 to 2021 were identified. Charts were reviewed for use of adjuvant treatment modalities, history of prior head and neck oncologic treatment, and outcomes. The primary outcome was wound dehiscence. **Results:** 10 patients were identified who met inclusion criteria. The mean age at diagnosis was 65 years with mean followup time of 23 months. 8 of the 10 patients had previously been treated for malignancies of the oropharynx, all of whom received adjuvant radiation as part of their prior treatment regimen. Neither of the 2 patients without prior head/neck oncologic treatment developed wound dehiscence. 50% of those who were previously treated for head and neck malignancies developed breakdown of the mandibulotomy site (3 with soft tissue wound dehiscence, 1 with osteoradionecrosis). All soft tissue wounds developed within 15 days of surgery, while osteoradionecrosis was a delayed complication. All wounds were successfully managed with local wound care. **Conclusions:** There appears to be a higher risk of postoperative wound breakdown after midline mandibulotomy for those who have received prior radiation to the head/neck. While this technique provides improved access for oncologic resections, patients should be adequately counseled regarding the potential complications.

144. Perineural Invasion in Ethmoid and Nasal Cavity Squamous Cell

Carcinoma

Sifon Ndon, MD, San Francisco, CA; Neil Patel, MD MSc, San Francisco, CA; Ivan El-Sayed, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of perineural invasion in prognostication for sinonasal squamous cell carcinoma.

Objectives: The AJCC does not include perineural invasion as a risk factor for sinonasal squamous cell carcinoma (SCC). We sought to ascertain whether PNI is correlated with increased risk of local recurrence. **Study Design:** Retrospective review. **Methods:** Patients diagnosed with ethmoid or nasal cavity SCC treated surgically at a single institution from 2002 to 2019 were identified. Charts were reviewed for staging, treatment, pathology, and outcomes. The primary outcome was local disease recurrence. **Results:** 36 of 86 patients had complete information with mean followup time of 63 months. Initial staging was divided into T1/T2 (36%) and T3/T4 (64%). Pathologic PNI was identified in 36% of patients, and 19% developed a local recurrence. Treatment included surgery alone (28%), or surgery with adjuvant treatments (72%). All patients with PNI had advanced stage tumors. We found a higher proportion of local recurrence amongst patients with PNI ($P=0.6$), with no independently significant variables on multivariate analysis. **Conclusions:** PNI appears to be associated with a higher risk of local recurrence in patients with sinonasal SCC. All patients with PNI had advanced tumors, and therefore received adjuvant treatment. It is therefore difficult to determine the role of PNI as an independent variable, yet our low local recurrence rate of 19% compares favorably with the literature and highlights the importance of adjuvant therapies.

145. Facial Paralysis following a Fine Needle Aspiration of a Benign Parotid Gland Mass

Kenny Nguyen, MEd, Burlington, VT; Quinn Self, MD, Burlington, VT; George Kurien, MD, Burlington, VT; William J. Brundage, MD, Burlington, VT; Allison L. Ciolino, MD, Burlington, VT; Mirabelle Sajjisevi, MD, Burlington, VT

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that facial nerve paralysis is an extremely rare complication following parotid fine needle aspiration and recognize this rare adverse outcome given its significant clinical implications.

Objectives: Report of facial nerve paralysis following parotid fine needle aspiration. **Study Design:** Case report and review of literature. **Methods:** Case report of a single patient. **Results:** A 90 year old male presented with a 2 month history of a painless right parotid gland mass. Computed tomography demonstrated a 2 centimeter, slightly hyperattenuating nodule in the superficial right parotid. He underwent two fine needle aspiration (FNA) biopsies, the first of which was non-diagnostic and the second suggestive of a pleomorphic adenoma. After the first FNA, he developed right lower eyelid and nasolabial fold weakness. He underwent a superficial parotidectomy, where the mass was noted to be cystic and densely adherent to the zygomatic branch of the facial nerve. Given the branch was already nonfunctional, it was sacrificed due to concerns for nerve involvement and to allow for complete removal of the mass. Final pathology was suggestive of an inflammatory or infectious etiology with no evidence of malignancy. Compression, fibrosis, and acute hemorrhage was seen in adjacent nerve branches on histopathology.

Conclusions: Facial nerve paralysis from FNA of parotid neoplasms is extremely rare and has only been reported in association with hematoma formation, where paralysis was temporary. In this case, no hematoma was identified and the paralysis persisted. The nerve was sacrificed during surgery given it was nonfunctional and inseparable from the mass, which was ultimately benign. This rare adverse outcome is important to recognize given its significant clinical implications.

146. Utilization of Digital Opioid Monitoring after Head and Neck Surgery
Vivek Pandrangi, MD, Portland, OR; Gabby Lilly, MD, Portland, OR; Ryan Li, MD, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how digital pill dispensing devices may facilitate development of postoperative pain control protocols and improve patient care.

Objectives: To evaluate utility of a digital pill dispensing and tracking system for monitoring post-discharge opioid consumption and pain levels after head and neck surgery. Study Design: Prospective cohort study at a single academic institution of patients undergoing head and neck surgery from August 2020 to February 2022. Methods: Patients utilized Bluetooth pill dispensing devices (Pilleve Inc.) to access opioid medications after discharge. Device use required access through a smart-phone application, and upon use patients completed a pain score (scale of 0-10). Data was accessed in real time and opioid medication was quantified in milligram morphine equivalents (MME). Results: There were 11 patients enrolled. The majority were male (n=10, 91%), with oropharynx primary site most common (n=5, 45.5%). Mean (standard deviation) age was 58.5 (8.7) years. Four patients did not utilize devices upon discharge. Three patients demonstrated good device utilization and complete data, and 4 patients had difficulty with device use leading to partial (n=3) or no data (n=1). Among patients with data available (n=6), mean daily opioid use was 30.3 (20.4) MME, and mean daily pain score was 5.4 (2.2). Daily MME was inversely correlated with discharge day ($r=-0.4$, $p=0.007$). Opioids were most commonly utilized in the early morning (12-6AM), 28.4% (28.4%), followed by afternoon (12-6PM), 28% (28.9%), late morning (6AM-12PM), 25.4% (28.7%), and evening (6PM-12AM), 13.2% (16.4%). Conclusions: Digital pill dispensing devices may facilitate monitoring of postoperative opioid use after head and neck surgery and development of improved analgesia strategies with the rich data information that is generated.

147. Evaluating YouTube Videos on Transoral Robotic Surgery as an Educational Resource for Trainees

Ramez Philips, MD, Philadelphia, PA; Eric Mastrolonardo, MD, Philadelphia, PA; Daniel Campbell, MD, Philadelphia, PA; Adam Luginbuhl, MD, Philadelphia, PA; Joseph Curry, MD, Philadelphia, PA; David Cognetti, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the value of YouTube as an educational resource for transoral robotic surgery. Participants should be able to utilize different metrics to evaluate content and popularity of educational videos.

Objectives: This study aims to evaluate the content of transoral robotic surgery YouTube videos as an educational resource for trainees. We also obtained data on video metrics as an assessment of popularity. Study Design: Cross-sectional

study. Methods: A YouTube video search identified 250 videos across five search terms: TORS ENT, TORS head neck, transoral robotic surgery, TORS surgery, transoral robotic surgery head neck. Videos with the primary aim of educating trainees were included. Videos not intended for surgical education, not relevant to TORS, without audio, or not in English were excluded. The educational value of the videos was assessed using the modified DISCERN criterion (range: 5-25) and a novel TORS criterion (NTC) (range: 0-12). Popularity was determined using the Video Power Index which utilizes views, comments, and likes per day to evaluate popularity. Results: After excluding 140 duplicate occurrences and 81 videos not meeting criteria, 29 videos were included for review. Fifty (45.5%) videos were excluded as not being intended for surgical education. Eighteen included videos (62.1%) were lecture based, while 11 (37.9%) videos were operating room (OR) based. Overall video quality was poor across both scoring systems: modified DISCERN (15.4 +/- 5.7); NTC (4.2 +/- 2.2). The majority of videos adequately discussed TORS indications (86.2%) and surgical anatomy (82.6%). A minority of videos adequately discussed resectability considerations (27.6%), primary console instructions (6.9%), or TORS related complications (31.0%). Both modified DISCERN ($r=.86$, $p<0.001$) and NTC ($r=0.41$, $p<0.05$) scores directly correlated with video duration. Only modified DISCERN scores correlated with VPI ($r=.45$, $p<0.05$). Videos uploaded by individual YouTube uploaders had significantly lower modified DISCERN than academic medical centers or educational companies (ANOVA $p<0.01$). Videos uploaded by academic medical centers had significantly higher likes, comments, and VPI values ($p<0.05$) compared to nonacademic videos. Conclusions: The majority of YouTube videos related to TORS are not intended for surgical education. There is opportunity for medical institutions to produce higher quality and more accessible surgical education videos on TORS.

148. Increasing Authors in Otolaryngology Journals From 1986 to 2021
 Kavita Prasad, BA, Nashville, TN; Rahul K. Sharma, MD, Nashville, TN;
 Michael C. Topf, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss trends in authorship counts in otolaryngology journals over the past 35 years.

Objectives: Publication volume has become a measure of productivity and contribution to one's field. There has been an increasing number of authors per peer reviewed article identified in many specialties. We aim to conduct the first evaluation of this trend in otolaryngology literature. Study Design: Literature review. Methods: Publication records from three otolaryngology journals (JAMA Otolaryngology-Head and Neck Surgery (JAMA-OTO) (formerly Archives of Otolaryngology-Head and Neck Surgery), Laryngoscope, Otolaryngology-Head and Neck Surgery (Otolaryngology-HNS)) were extracted from PubMed. All original, peer reviewed articles published between January 1986 and 2021 were included. Linear regression analysis was utilized to understand trends. Results: A total of 56,370 articles (8,531 JAMA-OTO, 15,218 Laryngoscope, and 12,045 Otolaryngology-HNS) published between January 1986 and 2021 were included. The mean number of authors increased from 2.8 to 5.7 across the study period. In 2021, average authors/journal were 4.4 for JAMA-OTO, 6.1 for Otolaryngology-HNS, and 6.5 for Laryngoscope. The Laryngoscope had the largest increase at 0.17 authors per article per year ($p < 0.001$) compared to 0.05 for JAMA-OTO and 0.10 for Otolaryngology-HNS. The rate of increase in authors between 1986-2000 was 0.058 ($p < 0.001$), between 2001-2021 was 0.141 ($p < 0.01$), and since 2010 was 0.177

($p = 0.0046$). The percentage of article with more than 10 authors increased from 0.7% prior to 2011 to 14% thereafter. Conclusions: Over the last four decades, the number of authors per peer reviewed article in three academic otolaryngology journals increased significantly. Benefits and drawbacks of this trend, including greater emphasis on quantity over quality, require further conversation throughout the field of otolaryngology.

149. Da Vinci SP Assisted Resection of a Large Hypopharyngeal Spindle Cell Lipoma

Sahithi Reddi, MS, Piscataway, NJ; Craig Bollig, MD, New Brunswick, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the clinicopathologic features of spindle cell lipomas, the advantages of a transoral robotic approach, and outcomes of similar cases in the literature.

Objectives: Spindle cell lipomas are rare variants of lipomas that may be misdiagnosed as liposarcomas and are extremely uncommon in the hypopharynx. We present a case of an elderly patient with a history of cervical spine fusion, who presented with obstructive symptoms and was found to have a large, pedunculated hypopharyngeal mass. He underwent a successful resection with the DaVinci SP with resolution of symptoms. **Study Design:** Case report. **Methods:** Case report. **Results:** A 68 year old man presented with progressive difficulty swallowing and intermittent difficulty breathing, was found to have a large, pedunculated hypopharyngeal mass on flexible laryngoscopy. Computed tomography revealed a 3cm soft tissue mass. An outside otolaryngologist was unable to adequately expose the patient with traditional suspension microlaryngoscopy due to a history of cervical spine fusion. He underwent a resection using the Da Vinci SP platform and experienced an uneventful recovery. Pathology returned as a spindle cell variant of lipoma. Pathologic features and outcomes of similar cases will be reviewed. **Conclusions:** Spindle cell lipomas are uncommon variants rarely occurring in the hypopharynx that may be misdiagnosed as liposarcomas. Robotic resection with the Da Vinci SP may offer improved transoral access compared to traditional suspension microlaryngoscopy, and older Da Vinci platforms, especially in patients with challenging exposures.

150. Ultrasound Elastography: A Novel Tool for Quantifying the Severity of Radiation Induced Fibrosis in Head and Neck Cancer Survivors

Bryan Renslo, BS, Kansas City, KS; Tuleen Sawaf, BS, Kansas City, KS; Celina Virgen, MD, Kansas City, KS; Sufi M. Thomas, PhD, Kansas City, KS; Jill Jones, MD, Kansas City, KS; Andres Bur, MD FACS, Kansas City, KS

Educational Objective: At the conclusion of this presentation, the participants should be able to identify ultrasound elastography as a diagnostic tool for the measurement of radiation induced fibrosis in head and neck cancer.

Objectives: Patients treated with adjuvant radiation for head and neck cancer (HNC) often develop radiation induced fibrosis (RIF), causing side effects including dysphagia and pain. However, the severity of fibrosis remains underdocumented due to the lack of validated tools. In this pilot study, we explore the use of ultrasound elastography (USE) as a method for quantifying the severity of RIF in HNC survivors. **Study Design:** Case control study. **Methods:** Patients one year or more

post-treatment (surgery and adjuvant radiation) for HNC were enrolled. Control patients included individuals with no history of HNC. USE was performed, and median stiffness was recorded based on ten measurements each at the right sternocleidomastoid (RSCM), right soft tissue, left sternocleidomastoid (LSCM), left soft tissue, and base of tongue. Patients were also assessed with MDADI and EORTC symptom scale surveys. Results: A total of 13 patients were consented for the study, with 7 HNC and 6 control patients. Mean age of participants was 64.5. Gender and smoking status proportions did not differ between the groups. HNC patients showed significantly lower swallow related function on the MDADI (2.89 vs. 4.46, $p=0.001$) and higher symptomatology on the EORTC (1.90 vs. 1.19, $p=0.002$). Tissue stiffness was significantly higher among HNC patients at the RSCM (55.1kPa vs. 20.1kPa, $p=0.018$) and LSCM (46.7kPa vs. 22.3kPa, $p=0.038$). Conclusions: UES is a novel tool for quantifying the severity of RIF in HNC patients. This may be useful for measuring the efficacy of preventative therapies aimed at reducing RIF.

151. Facilitators and Barriers to Smoking Cessation for Rural Head and Neck Cancer Patients: a Qualitative Study of Patients and Cancer Care Providers

Katherine K.S. Rieth, MD MPH MA, Rochester, NY; Hannah Teets, Rochester, NY; Nicole Mercer, Rochester, NY; Scott McIntosh, PhD, Rochester, NY; Anapaula Cupertino, PhD, Rochester, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe factors that affect smoking cessation for rural head and neck cancer patients identified through qualitative analysis and how this can guide development of a tailored cessation program.

Objectives: To assess facilitators and barriers to tobacco cessation among rural head and neck cancer (HNC) patients from both patient and provider perspectives to develop a tailored cessation intervention. Study Design: This is a qualitative study using transcribed semistructured interviews to identify themes among HNC patients and providers of HNC care to guide development of a smoking cessation intervention for this high risk population. Methods: Patients who meet eligibility criteria (at least 21 years old, HNC diagnosis, and smoking history) are recruited at a clinical visit. Providers who meet eligibility criteria are recruited through email. Semistructured interviews are conducted over Zoom, recorded, and transcribed. Transcribed interviews are then coded for emergent themes based in grounded theory to develop assessments and recommendations for the proposed intervention. Results: 5 patient interviews and 7 provider interviews have been completed to date. Recruitment is ongoing. Among the 5 patients interviewed, two are currently smoking. Preliminary analysis demonstrates emerging themes around having cancer as an event to promote smoking cessation, as well as the role of personal motivation in being successful with quit attempts. Preference for a hybrid model (in-person with texting or online platform) for smoking cessation is expressed. From provider perspectives, challenges include transportation and technology accessibility. Emerging themes around a nurse navigator model for smoking cessation are also evident. Conclusions: Preliminary analysis of qualitative data suggests that time of diagnosis is a pivotal moment for engaging rural HNSCC patients in smoking cessation that can be continued with a dedicated healthcare team member through a hybrid program model.

152. Length of Stay in Skilled Nursing Facilities for Tracheostomy Patients: Does Location Matter?

Mandy K. Salmon, BS, Philadelphia, PA; Elizabeth A. Sell, BS, Philadelphia, PA; Evan Cretney, MD, Philadelphia, PA; Robert M. Brody, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the influence of distance from patient home to closest skilled nursing facility (SNF) for patients with tracheostomy who are discharged to SNF.

Objectives: Skilled nursing facilities (SNFs) are often limited in ability to care for complex patients, such as those requiring tracheostomy care. We sought to determine if absence of available SNFs in a close radius to tracheostomy patients impacts their hospital length of stay (LOS). **Study Design:** Retrospective analysis of all tracheostomy patients between July 2021 and March 2022 using our institution's internal length of stay database. **Methods:** Patient addresses were abstracted from review of the electronic medical record. A list of available SNFs that accept patients with tracheostomy was acquired from the department of social work. SNF addresses and patient addresses were converted to latitude and longitude coordinates, and distance between the two locations was determined using the Haversine sine formula. Length of stay was compared between patients living within 30 miles of a SNF that accepts tracheostomy patients and patients living greater than 30 miles from a SNF that accepts tracheostomy patients. **Results:** Eighty-one patients received tracheostomy and were discharged to SNF in the time period analyzed. Of these patients, 71 lived within a 30 mile radius of a SNF that accepts patients with tracheostomy. There was no statistically significant difference in LOS between these patients and patients who lived further ($p=0.24$). **Conclusions:** Distance to nearest SNF from patient home does not appear to predict difference in LOS for patients hospitalized with tracheostomy pending discharge to SNF and should likely not be used to determine patient disposition.

153. Laryngopharyngectomy and ACDF for Cervical Spine Osteomyelitis and Epidural Abscess after Radiation for Head and Neck Carcinoma: A Case Series

Mohamad Z. Saltagi, MD, Indianapolis, IN; Abdul Kadir Saltagi, BS, Indianapolis, IN; Michael G. Moore, MD, Indianapolis, IN; Avinash Mantravadi, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize presenting symptoms of this complication of chemoradiation therapy for prior head and neck cancer, along with the surgical management of this complication involving total laryngopharyngectomy and ACDF.

Objectives: Describe the presentation of cervical spine osteomyelitis and epidural abscess, a rare complication of chemoradiation therapy for head and neck carcinoma and the surgical management involving total laryngopharyngectomy and anterior cervical discectomy and fusion (ACDF). **Study Design:** Retrospective case review. **Methods:** After obtaining institutional review board approval, the medical record database was used to review the patients' information and evaluated for patient demographics, presenting symptoms, head and neck cancer history, chemoradiation therapy regimen (including total radiation exposure and intensity), radiographic characteristics, intraoperative approach and findings, postoperative hospital course, and long term swallowing and tissue healing outcomes. **Results:** Three patients presented with radiographic evidence of cervical spine osteomyeli-

tis and epidural abscess and had a history of prior radiation therapy for head and neck squamous cell carcinoma (SCC). All three patients presented with dysphasia, a nonfunctional larynx, and neurological symptoms. All three patients underwent ACDF and total laryngopharyngectomy with tubed free flap pharyngeal reconstruction. Two patients healed well postoperatively without acute or long term complications. One patient had wound complications following surgery and required readmission and revision surgery. Conclusions: Cervical spine osteomyelitis and epidural abscess are very rare complications of prior radiation therapy in patients with a history of head and neck cancer. This presents a challenging clinical condition which can be life threatening for patients. Laryngopharyngectomy and ACDF with free flap reconstruction is a surgical management option to remove the nidus of infection as well as improve neurological symptoms associated with the condition, and this has been successfully performed in our cohort.

154. The Impact of COVID-19 on Academic Productivity among Head and Neck Surgery Fellows

Nadia L. Samaha, BS, Washington, DC; Kaelyn N. Gwynne, BS, Washington, DC (Presenter); Jackson Randolph, MD, Washington, DC; Amanda R. Walsh, MD, Washington, DC; Jessica H. Maxwell, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand factors that influence research productivity among head and neck surgery fellows, including the COVID-19 pandemic and gender; and 2) determine whether research productivity before residency predicts productivity in future stages of their career.

Objectives: To examine the impact of the COVID-19 pandemic, gender, and pre-residency publications on research productivity among head and neck surgery fellows. Study Design: Cross-sectional. Methods: Previous head and neck surgery fellows were identified from publicly available data between 2014 and 2020. Timing of fellowship graduation, gender, number of publications and type of authorship throughout training and career were analyzed for association with scholarly productivity. Results: Among 315 fellows, 223 were male (70.8%) and 92 were female (29.2%), representing 6,720 publications. The class of 2020, those affected most by the COVID-19 pandemic, averaged 2.767 publications throughout fellowship, significantly more than the average of 1.739 publications for the classes of 2014-2019 ($p=0.016$). The average number of publications before residency was 2.12. The 90 fellows who published more than average before residency had significantly higher productivity during residency and fellowship (10.667 publications) compared to the 225 fellows who published less than average pre-residency (5.587 publications, $p<0.0001$). Gender did not significantly impact research productivity ($p=0.223$). The journals most commonly represented were The Laryngoscope (741 publications), Head & Neck (693), Otolaryngology-Head and Neck Surgery (557), JAMA Otolaryngology Head and Neck Surgery (370), and Oral Oncology (349). Conclusions: During the COVID-19 pandemic, head and neck surgery fellows had increased academic productivity compared to the pre-pandemic classes. Fellows with above average research productivity before residency had higher academic productivity during residency and fellowship.

155. Impact of Medicare Eligibility on Head and Neck Cancer Treatment and Survival Outcomes: A SEER Propensity Matched Cohort Study
Neel R. Sangal, MD, Philadelphia, PA; Emma DeRavin, BA, Philadelphia,

PA; Robert Brody, MD, Philadelphia, PA; Brant Jason, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the impact of Medicare on diagnosis, treatment, and outcomes of head and neck squamous cell carcinoma.

Objectives: A “Medicare effect” with increased healthcare utilization and reductions in cancer specific mortality has been demonstrated at the age of 65. This study aimed to evaluate the impact of Medicare eligibility on survival outcomes in patients with head and neck squamous cell cancer (HN-SCCa). **Study Design:** Retrospective propensity matched cohort study. **Methods:** Patients aged 60-69 years with HN-SCCa from 2004-2014 were identified via the SEER database and divided by Medicare eligibility status (60-64, Medicare ineligible; 65-69, Medicare eligible). The Medicare ineligible uninsured (MI-uninsured) and Medicare eligible patient cohorts were propensity score matched with respect to demographics and clinicopathologic characteristics; survival outcomes were compared. **Results:** 22,672 HNSCC patients were identified. The Medicare ineligible patients were significantly more likely to be uninsured (5.3% vs. 0.9%, $p < 0.001$). There were 679 MI-uninsured and 11,015 Medicare eligible patients. MI-uninsured patients were more likely to present with late tumor stage (stage III-IV; 68.3% vs. 56.1%, $p < 0.001$). After PSM, univariate analyses identified treatment type differed significantly between the groups ($p = 0.002$), with MI-uninsured patients more commonly receiving no treatment (14.2% vs. 7.9%) and less frequently receiving trimodality therapy (10.9% vs. 15.2%). MI-uninsured patients demonstrated significantly lower 5 year DSS (60.9% vs. 73.4%, $p < 0.001$) and a higher risk of all cause mortality (HR: 1.33, 95% CI: 1.07-1.67) in this matched cohort. **Conclusions:** Despite the significant comorbidities associated with increasing age, Medicare coverage at the age of 65 may result in improved DSS and OS in HNSCC patients aged 65-69 compared to those who are Medicare ineligible.

156. Prognostic Significance of Acute Hemorrhage Requiring Embolization in Previously Treated Head and Neck Squamous Cell Carcinoma

Tuleen Sawaf, BS, Kansas City, KS; Celina G. Virgen, MD MPH, Kansas City, MO; Bryan Renslo, BS, Kansas City, MO; Omar Karadaghy, MD, Kansas City, MO; Kevin J. Sykes, PhD MPH, Kansas City, MO; Andres M. Bur, MD, Kansas City, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to better stratify the prognosis of patients after endovascular embolization for acute hemorrhage in the setting of head and neck squamous cell carcinoma (HNSCC) previously treated with primary or adjuvant radiation therapy (RT).

Objectives: To characterize the prognosis after endovascular embolization for acute hemorrhage in patients with HNSCC previously treated with primary or adjuvant RT. **Study Design:** Case series. **Methods:** We identified patients who received treatment for HNSCC with primary or adjuvant RT and presented to our medical center with acute hemorrhage. Patient characteristics, oncologic history, and hemorrhage outcomes were reviewed. Those who received endovascular embolization were included, and patients with carotid blowout syndrome were excluded. Outcomes included time to hemorrhage and median survival time. Kaplan Meier survival analysis was performed. **Results:** Twenty-five patients were included.

Median age at diagnosis was 58.1 years (IQR: 51.2-64.8). Most primary tumors were oropharyngeal (52%), followed by oral cavity (17%). Twenty-one patients received definitive primary or adjuvant RT, and six patients received salvage RT for recurrence. Median time to hemorrhage from last treatment was 71.5 days (IQR: 16.75-186.5). Cause of hemorrhage was commonly attributed to tumor recurrence or persistent disease (60%) with embolization of the lingual artery performed in most cases (60%). Overall median survival after embolization was 1.65 months (0.92-3.25). Hemorrhage due to tumor burden resulted in trends towards shorter median survival compared to soft tissue necrosis or pseudoaneurysm (1.0 vs. 2.2 months, $p=0.10$). Cause of death, when known, was related to cancer progression in hospice ($n=9$) and persistent hemorrhage ($n=3$). Conclusions: Post-treatment hemorrhage is a rare but catastrophic presentation in HNSCC. Our series demonstrates the poor prognostic significance of this presentation, suggesting the need to manage expectations for embolization and prepare patients and families for end of life discussions.

157. Preexisting Psychiatric Disorders Associated with Advanced Disease in Head and Neck Squamous Cell Carcinoma

Holly D. Shan, BS, Washington, DC; Hunter B. VanDolah, BS, Washington, DC; Jason R. Crossley, MD, Washington, DC; Lacey L. Nelson, MD, Washington, DC; Jessica H. Maxwell, MD, Washington, DC; Bruce J. Davidson, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand preexisting psychiatric disorders may influence time to diagnosis, stage at presentation, and locoregional recurrence among head and neck cancer squamous cell cancer patients.

Objectives: The impact of preexisting psychiatric disorders on head and neck cancer (HNC) outcomes is unknown. This study aims to explore the role of preexisting psychiatric disorders on time to diagnosis, cancer stage at presentation, and locoregional recurrence among HNC patients. Study Design: Retrospective cohort review. Methods: A single institution retrospective review of patients with head and neck squamous cell carcinoma (HNSCC) between 2019 and 2022 was performed. A psychiatric cohort (psych comorbid) was identified using DSM-5 clinical diagnoses of addiction, anxiety, delirium, bipolar disorder, schizophrenia, dementia, major depressive disorder, or seizure disorder. Demographics, comorbidities, time to presentation, stage, locoregional recurrence, and mortality were assessed. Results: Of 157 patients included, 37 (23.57%) had a psychiatric diagnosis and 120 (76.43%) served as controls. Psych comorbid patients had a higher rate of T4 disease (61.36% vs. 38.65%, $p=0.001$) and greater rate of recurrence compared to the control group (38.89% vs. 17.74 %; $p=0.001$). The Psych comorbid cohort trended toward a longer time between onset of symptoms to HNC diagnosis (44.50 vs. 30.62 days, $p=0.2$) but did not reach a statistically significant difference. Conclusions: Patients with preexisting psychiatric disorders had a higher rate of T4 disease and locoregional recurrence and trended towards a longer time to HNC diagnosis from symptom onset. Larger cohorts may be useful to determine if delayed presentation amongst patients with psychiatric disease contributes to development of more advanced disease.

158. The CAD Margin: Ex vivo 3D Specimen Mapping to Improve Communication between Surgeons and Pathologists

Kayvon Sharif, BA, Nashville, TN; James Lewis Jr., MD, Nashville, TN;

Alexis Miller, BA, Nashville, TN; Kavita Prasad, BA, Nashville, TN; Eben Rosenthal, MD, Nashville, TN; Michael C. Topf, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the utility of 3D scanning and computer aided design (CAD) software in the intraoperative communication of specimen driven margin analysis in head and neck oncologic surgery.

Objectives: To enhance surgeon pathologist communication during frozen section margin analysis in head and neck cancer surgery using intraoperative, virtual three dimensional (3D) anatomic guidance. **Study Design:** Prospective feasibility study. **Methods:** A structured light 3D scanner was used to capture the surface topography of fresh, ex vivo surgical specimens received for specimen driven frozen section analysis. Computer aided design (CAD) software was used to virtually demarcate the anatomic site of margin sampling along the specimen in real time. Frozen section diagnosis and margin status were communicated to the operating room by videoconference with the aid of the 3D specimen map. **Results:** A series of 11 cases were included: 6 oral cavity composite resections, 2 transoral robotic tonsillectomies, 2 partial glossectomies, and 1 total laryngectomy. Median 3D image acquisition time was 7:36. Virtual 3D intraoperative surgical guidance communicated a close / positive margin in 7 cases. Subsequent re-resection of the anatomic site corresponding to the close / positive margin and negative final margin status was achieved in all but 1 case, in which tumor was extending through the superior constrictor and further re-resection was not feasible. **Conclusions:** Intraoperative use of 3D scanning and CAD software may serve as a valuable adjunct to standard surgical pathology and margin assessment practices. Surgeons benefit from visuospatial cues while relocalizing the site of positive margins from the specimen to the defect. Pathologists benefit from enhanced 3D orientation and documentation of the resection specimen. This technique may help to ultimately reduce the incidence of positive margins and associated morbidity in the head and neck cancer population.

159. **Association between Emergent Versus Elective Tracheostomies and High Resource Utilizing Postoperative Outcomes**

Dhiraj Raju Sibala, BS, Newark, NJ; Sree Chinta, BS, Newark, NJ; Keshav Dilip Kumar, MPH, Newark, NJ; Dhruv Mendiratta, BS, Newark, NJ; Michael S. Hegazin, DO, Newark, NJ; Jean Anderson Eloy, MD FACS, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the implications of emergent versus elective surgery status on postoperative outcomes in tracheostomy.

Objectives: In this study, we investigate the association between emergent versus elective surgery and postoperative complications in tracheostomy. **Study Design:** Retrospective database review. **Methods:** The National Surgical Quality Improvement Program (NSQIP) database was queried for patients who underwent tracheostomy between 2005 and 2018. Univariate and multivariable analyses were conducted to determine associations between emergent and elective status and postoperative complications. **Results:** 3,512 patients undergoing tracheostomy were queried, of which 3,359 (95.6%) were elective cases and 153 (5.4%) emergent cases. Upon univariate analysis, emergent status was associated with lower age, Black race, higher ASA class, diabetes mellitus (DM), ventilator use, CHF,

open wound, bleeding disorder, steroid use, sepsis, dependent status, superficial and organ space surgical site infection (SSI), cumulative medical, pulmonary, and renal complications, pneumonia, ventilation over 48 hours, unplanned intubation, acute renal failure, sepsis, septic shock, and cumulative morbidity. Multivariable analyses showed a higher association between emergent cases and pulmonary complications (OR=2.388, CI:1.474-3.866, $p < 0.001$), ventilator use over 48 hours (OR=2.807, CI:1.606-4.905, $p < 0.001$), acute renal failure (OR=6.046, CI:1.010-36.185, $p=0.049$), and sepsis (OR=2.950, CI:1.364-6.378, $p=0.006$). Conclusions: Patients with emergent tracheostomies had greater odds of cumulative pulmonary complications, ventilator use longer than 48 hours, acute renal failure, and sepsis than those undergoing elective procedures.

160. Online Education about Sialendoscopy: A Study about Readability and Reliability

Rohan A. Singh, Washington, DC; Christopher Badger, MD, Washington, DC; Arjun S. Joshi, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the readability and reliability regarding online information about sialendoscopy using objective measures.

Objectives: Sialendoscopy is a diagnostic and interventional treatment for patients with salivary disease. Patients and physicians leverage website information to acquire knowledge about sialendoscopy. This study assesses the readability and reliability of online information available for sialendoscopy. Because patients scour the internet for information related to sialendoscopy, understanding its quality is essential. Study Design: Metric based analytical website review. Methods: The term "sialendoscopy" was searched on Google in May 2022. The top 100 websites were evaluated. Each website was required to meet 3 criteria: accessible when opened, content deemed relevant, and available in written format. The readability and reliability of each website was analyzed. The readability was measured using the Flesch Reading Ease, Flesch-Kincaid Grade, Gunning-Fog Index, and the Smog Index. The quality was assessed with the Discern instrument, American Medical Association (AMA) benchmark criteria, and the Health on the Net Foundation code certification. Results: Forty-two websites met the inclusion criteria. The majority were hosted by academic institutions (15), followed by physician websites (11), or affiliated hospitals (7). The mean Flesch Reading Ease score was 40.8, aligning with the "difficult to read" category (2nd lowest readability category). Other readability metrics aligned with a high school reading level. The mean reliability score on the Discern instrument was 36.9 (16-80), corresponding with the "poor" quality category. The mean reliability on the AMA benchmark was 1.8 (4 point scale). Conclusions: Online educational information for sialendoscopy is suboptimal in both readability and reliability metrics. Healthcare organizations should consider enhancing and simplifying their content to benefit patients seeking treatment options.

161. Prognostic Implications of Occult Lymph Node Metastasis in Submandibular and Sublingual Gland Malignancies

Shady I. Soliman, MS, La Jolla, CA; Isaac Solomon, BA, La Jolla, CA; Farhoud Faraji, MD PhD, La Jolla, CA; Ryan Orosco, MD, La Jolla, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize patterns and implications of occult lymph node metas-

tasis in submandibular and sublingual gland malignancies.

Objectives: Regional metastasis in salivary gland cancer is associated with worse outcomes and guides therapeutic decision making. However, the patterns of regional lymph node metastasis remain incompletely understood. In this study, we evaluate rates occult nodal disease in submandibular and sublingual salivary gland malignancies and define the effect of occult nodal metastasis on survival. **Study Design:** The National Cancer Database was queried for adults diagnosed with primary submandibular and sublingual gland carcinoma from 2004-2019 who underwent curative intent treatment. **Methods:** Survival was compared between regional metastases and negative nodal groups using Kaplan-Meier analysis and log rank tests. **Results:** In this cohort of 4,242 patients, the average annual incidence of carcinoma was 265 (SD=30). Eight histopathologies were analyzed; the most common were 50.0% adenoid cystic and 24.5% mucoepidermoid carcinoma. Thirty-four percent of patients received a neck dissection, and only 3.1% of patients had occult nodes. Overt nodal metastasis (range 7-41%) varied by histopathology ($p < 0.001$) but occult nodal disease (range 1.0-4.6%) did not ($p = 0.226$). The highest incidence for occult nodal disease were observed in salivary ductal carcinoma (4.6%), carcinoma expleomorphic adenoma (4.3%), and basal cell adenocarcinoma (4.4%). Patients with overt nodal metastases (5 year OS, 79% vs 38%, $p < 0.001$) and occult lymph node disease (5 year OS, 77% vs 53%, $p < 0.001$) displayed worse outcomes than lymph node negative patients. **Conclusions:** The prevalence of occult nodal disease across different submandibular and sublingual gland malignancies did not vary significantly by histopathology. The proportion of overt nodal metastasis and rate of neck dissection varied by histopathology. Regional disease was associated with worse survival.

162. **Assessment of BMI as an Independent Predictor of Oropharyngeal Cancer Survival**

Patrick T. Spiller, MD, Shreveport, LA; Jonathan Austin Berry, MD, Jackson, MS; Runhua Shi, MD PhD, Shreveport, LA; Ameya Asarkar, MD, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate the effect that changes in BMI had on survival in patients with oropharyngeal squamous cell carcinoma during as well after their treatment.

Objectives: Predictors of survival in oropharyngeal squamous cell carcinoma (OP-SCC) have been studied with particular attention to HPV, smoking, and stage. Weight loss has been shown to predict worse survival in other types of cancer such as lung, larynx, and breast. The effect that BMI changes have on survival in patients with OPSCC has not been extensively studied. **Study Design:** Single institution retrospective cohort study. **Methods:** Charts were reviewed for patients diagnosed with OPSCC between 2012 and 2017. Variables of interest included HPV, smoking status, stage, overall survival, and disease free survival. Patients who had not completed definitive treatment were excluded. **Results:** 99 patients met inclusion criteria. The cohort was 87% male with an average age of 58.7 plus or minus 9.5. Between diagnosis and 3 months after treatment, BMI decreased an average of 3.76 points with p value less than 0.05. BMI was noted to increase one year after completion of treatment. Two years post treatment average BMI had decreased 2.24 points from the time of diagnosis. Dysphagia/odynophagia at diagnosis had worse overall survival (52.3 months) than those who had no swallowing trouble (64.1 months) with p value less than 0.05. There was no statistically signifi-

cant association between survival and BMI change during the study interval. Conclusions: Patients undergoing treatment for OPSCC had a statistically significant decrease in BMI during their treatment. This change in BMI did not affect survival in our cohort. Dysphagia/odynophagia at diagnosis predicted worse overall and disease specific survival. Further study of larger cohorts with OPSCC could help determine other factors affecting survival.

163. Efficacy of an Articulate Module: Tracheostomy and Laryngectomy Pearls for Healthcare Providers

Sruti Tekumalla, BA, Philadelphia, PA; Andrew Piacitelli, BS, Philadelphia, PA; Vanessa Christopher, MD, Philadelphia, PA; David M. Cognetti, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the anatomic variations between tracheostomies and laryngectomies. Participants should understand the importance of identifying surgical airways correctly. Participants should be familiar with Articulate, a web-based interactive software that was used to create our educational module regarding surgical airways. Participants should recognize that educational intervention on this topic is crucial for many non-otolaryngology specialties and providers.

Objectives: Patients with surgical airways, specifically tracheostomies and laryngectomies, are at risk of complications due to misidentification by providers. Our Articulate learning module aims to increase knowledge of surgical airways in non-otolaryngology healthcare providers in order to promote appropriate patient care. **Study Design:** We used Articulate, a web based interactive educational software, to design a module on surgical airways. We then conducted an experimental study to examine the effectiveness of the module using a quiz assessing provider knowledge and comfort. **Methods:** The module and assessment were distributed to residents in four non-otolaryngology specialties. Residents either completed the module and assessment (intervention) or completed only the assessment (control). A separate group of otolaryngology residents completed only the assessment to confirm validity. A one tail t-test comparison and p-value significance at level of 0.05 was used to assess a difference in average scores. **Results:** 42 residents were included in the study. The average score among otolaryngology participants (N=11) was 95.2%. Module completion was associated with statistically significant improved knowledge scores (anesthesiology and internal medicine) and gross identification comfort (all specialties) ($p < 0.05$). Among emergency medicine residents, there was a significant difference in assessment scores in both module and non-module groups compared to otolaryngology resident scores ($p < 0.05$). **Conclusions:** The Articulate module is a valuable tool for surgical airway education of non-otolaryngology providers, specifically in the specialties of anesthesiology and internal medicine. Based on our results, residents in emergency medicine require additional methods of surgical airway education.

164. Taste Dysfunction after Transoral Robotic Surgery

Theresa Tharakan, MD, St. Louis, MO; Ryan Jackson, MD, St. Louis, MO; Sidharth V. Puram, MD PhD, St. Louis, MO; Danielle Reed, PhD, Philadelphia, PA; Dorina Kallogjeri, MD MPH, St. Louis, MO; Jay F. Piccirillo, MD, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be familiar with objective and subjective taste testing methods and describe

changes in taste associated with transoral robotic surgery.

Objectives: To compare subjective and objective taste assessments before and after transoral robotic surgery (TORS). **Study Design:** Prospective cohort. **Methods:** Oropharyngeal (tonsil or tongue base) cancer patients undergoing TORS and age-/sex-matched controls were recruited. Participants underwent whole mouth quinine intensity (QI) taste testing preoperatively and at 2 weeks postoperatively or 2 weeks followup (controls). Surgeon reported glossopharyngeal nerve injury (GNI) and suspension time were collected. Participants reported a clinical global impression (CGI) of taste related quality of life at each time ("My sense of taste bothers me" on a 5 point Likert scale from never [0] to always [5]). A taste disorder (TD) was defined as CGI score of 3 (sometimes) or worse. Within subject change in QI was compared between experimental groups. **Results:** Twenty-three patients and 23 controls were enrolled. Of 17 patients and 20 controls who completed both test sessions, 2 patients (12%) and 1 control (5%) had TDs at baseline, while 11 patients (65%) and 1 control (5%) had TDs at 2 weeks. CGI had negligible relationship with GNI (Cohen's D = 0.12), suspension time (Spearman's rho = 0.27), and QI (Spearman's rho = -0.23). Change in QI was similar between experimental groups (Cohen's D = 0.14), had a moderate relationship with GNI (Cohen's D = 0.48), and a negligible association with suspension time (Spearman's rho = -0.2). **Conclusions:** TORS is associated with subjective postoperative taste disorders which are not reflected by traditional whole mouth taste intensity testing. Future research should define the role of objective taste tests in the diagnosis, counseling, and management of oropharyngeal cancer patients.

165. Association of Nicotine Dependence and New Adverse Life Events following a Head and Neck Cancer Diagnosis: Disproportional Impact on Women and Underrepresented Minorities

Zachary David Urdang, MD PhD, Philadelphia, PA; Kathleen Gillmore, BA, Philadelphia, PA; Eric V. Mastrodonardo, MD, Philadelphia, PA; Devin R. Amin, MD, Philadelphia, PA; Joseph M. Curry, MD, Philadelphia, PA; Leila J. Mady, MD PhD MPH, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to explore 1) the association of nicotine use prior to and following a head and neck cancer (HNC) diagnosis with new adverse life events (ALEs); and 2) potential differences in the burden of new ALEs for nicotine users after HNC diagnosis by sex and race.

Objectives: Determine 1) if new adverse life events (ALEs) (unemployment, housing insecurity) are associated with nicotine product use prior to and following head and neck cancer (HNC) diagnosis; and 2) explore differences in new ALEs among nicotine users with HNC by sex and race. **Study Design:** Retrospective cohort database study. **Methods:** Electronic medical record (EMR) data from the TriNetX Research Network was queried for nicotine users (ICD10 F17) prior to any HNC diagnosis (C00-14, C30-33, C73-75). Nicotine users were further stratified by continued nicotine use versus quit nicotine use after HNC diagnosis as well as by sex and race (US census defined). Primary outcome was defined as the odds of new ALEs (Z59-65) given nicotine use prior to and following HNC diagnosis, with subgroup analysis by sex and race [odds ratio with 95% confidence interval, (OR, 95%CI)]. **Results:** Nicotine users (n=63,086) had 2.7-higher odds (95% CI: 2.6-2.8) of experiencing any new ALE after HNC diagnosis versus non-users (n=370,869). Compared to non-users, nicotine users had 4.4 higher odds (95% CI: 3.9-4.9) and

2.9 higher odds (95% CI: 2.8-3.1) of experiencing housing insecurity and divorce, respectively. Continued nicotine users after diagnosis (n=35,300) had 1.9 higher odds (95% CI: 1.6-2.1) of any new ALE versus quit nicotine (n=7,414). Subgroup analysis among nicotine users revealed non-white and women patients both experience 1.3 higher odds (95% CI: 1.2-1.4) of a new ALE versus men and people who are white respectively. Conclusions: This study highlights the potential impact of nicotine use on social determinants of health in this population, with disparate impact on URM. Our findings emphasize the need to engage and empower behavioral modifications to quell nicotine dependence.

166. In Sickness and in Health: The Importance of Caregiver Retention in Head and Neck Cancer Patients

Celina Virgen, MD MPH, Kansas City, KS; Bryan Renslo, BS, Kansas City, BS; Tuleen Sawaf, BS, Kansas City, KS; Alexandra Arambula, MD, Kansas City, KS; Kevin Sykes, PhD MPH, Kansas City, KS

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss caregiver contributions to patient wellbeing along with the importance of caregiver retention and consistency among head and neck cancer (HNC) patient caregiver dyads.

Objectives: Caregiver retention and consistency among HNC patients is understudied. Caregiver presence is critical in caring for patients outside of the clinic and shared decision making. This study assesses potential risk factors for HNC caregiver attrition. Study Design: Prospective longitudinal cohort. Methods: Patient caregiver dyads were enrolled from May 2021 to June 2022 during the first visit with the HNC surgeon. Patient members expected to undergo primary surgical excision were enrolled with their caregivers. Dyad demographics collected included gender, race, age, insurance status, employment, and educational background. Patients completed the Medical Outcomes Study Social Support Survey (MOS-SSS). Caregivers completed surveys addressing their own health and caregiving burden. Comparisons of proportions were used to measure changes over time. Logistic regression was utilized to predict caregiver attrition. Results: There were 85 dyads enrolled. Preoperatively 17.7% of caregivers report spending greater than 10 hours per week providing care to the patients and postoperatively this increased to 59.5% (difference=41.8%, p=0.001, 95% CI: 24.0-56.8%). Similarly, the proportion of caregivers participating in clinical decisions moved from 55.4% to 81.0% (difference=25.6%, p=0.005, 95% CI: 8.1%-39.6%). Caregiver retention, defined as attending subsequent clinic visits, was only 35% (n=30). High patient perceived affectionate support (OR:1.70, 95% CI 1.04-2.78, p=0.035) predicted caregiver retention. By contrast, caregiver attrition was significantly associated with caregiver reported personal history of cancer (OR: 4.08, 95% CI 1.34-13.5, p=0.015). Demographics and caregiver health did not predict attrition. Conclusions: Caregivers are an important contributor to tangible, emotional, decision making support. Predicting attrition may help allocate dyad supportive resources to maintain this critical relationship and reduce caregiver burden.

167. Demographic and Perioperative Predictors of Non-Home Discharge after Total and Partial Thyroidectomy

Stephanie Yizhu Wang, BS, Philadelphia, PA; Neel R. Sangal, MD, Philadelphia, PA; Louis-Xavier Barrette, MD, Philadelphia, PA; Jason A. Brant, MD, Philadelphia, PA; Robert M. Brody, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify factors associated with non-home discharge after thyroidectomy.

Objectives: There has been no previous characterization of how demographic or perioperative factors predict complications leading to discharge to a facility for total and partial thyroidectomy patients. Study Design: Nationwide retrospective cohort analysis. Methods: Patients undergoing total and partial thyroidectomy were identified based on CPT codes and extracted from the 2012-2019 NSQIP database. Patients were categorized as having a discharge location as either home or to a facility. Univariate regressions were then conducted between appropriate demographic and perioperative factors and the discharge location. Significant variables were included in multivariate logistic regression. Results: Out of the 45,074 patients included, 313 (0.69%) were discharged to a facility other than home. On multivariate regression analysis for preoperative factors, patients were more likely to have a non-home discharge when they were male, older, a smoker, in a higher ASA classification, partially dependent health status, undergoing transthoracic thyroidectomy or thyroidectomy with neck dissection, ventilator dependent, experienced weight loss before surgery, or have severe COPD or preop systemic sepsis or disseminated cancer. Multivariate analysis for intraoperative factors showed length of total hospital stay and days from hospital admission to operation as significant. Regression analysis for postoperative variables showed that patients with postoperative pneumonia, intubation, stroke, bleeding requiring transfusion, sepsis, reoperation, or ventilator use greater than 48 hours were more likely to be discharged to facility. Conclusions: This study identifies perioperative characteristics that increase risk of discharge to facility in patients undergoing total and partial thyroidectomy. Patients should be risk stratified based on these findings so that appropriate planning can be considered.

168. **Thoracodorsal Artery Perforator Flap Reconstruction of Large and Hemiglossectomy Defects**

Weitao Wang, MD, Rochester, NY; Joel Fontanarosa, MD PhD, Rochester, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the indications and specific harvest techniques for the TDAP flap in glossectomy reconstruction.

Objectives: 1) Understand the clinical defects suitable for TDAP reconstruction; 2) describe the surgical technique with flap harvest and orientation of flap; and 3) understand the minimal donor site morbidity and cosmetic advantage of a hidden donor site. Study Design: In select cases where the thigh is too thick and there is inadequate skin and bulk from the forearm or Allen's test is positive, alternative flap options may be considered to optimize outcomes. There is little literature on the utility of the thoracodorsal artery flap (TDAP) in glossectomy reconstruction and we investigated our institutional outcomes with this technique. Methods: Retrospective single surgeon tertiary academic institution case series. Results: Four patients with primary tongue SCCa were included in this retrospective case series. 3 were male and 1 female with age range from 52 to 81 years. All patients had T4a oral tongue squamous cell carcinoma without mandible invasion. In all cases the TDAP flap was designed so the floor of mouth and tip of tongue was thin and pliable with a thicker base of tongue component and a small cuff of latissimus dorsi. One patient required return to or for hematoma evacuation on postoperative day

two and a secondary wound dehiscence closure. No flap losses were incurred and no fistula observed. All patients were decannulated and tolerating a liquid diet by time of discharge. No shoulder dysfunction was appreciated in all patients. None required prolonged tube feed requirements. Conclusions: The TDAP flap has the benefit of pliability qualities of the radial forearm, as well as bulk to bolster the base of tongue tissue volume. The minimal donor site morbidity and hidden incision along the axillary line make it an ideal option for large glossectomy defects.

169. Cannabinoid Use in Adult Patients with Head and Neck Squamous Cell Carcinoma

Nicole Wershoven, MD, Burlington, VT; Mirabelle Sajisevi, MD, Burlington, VT

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize that monitoring cannabis trends can provide useful information to further guide research in this minimally published area.

Objectives: This study's purpose was to assess and identify current patterns and trends of cannabis use among adult patients with a diagnosis of head and neck cancer squamous cell carcinoma (HNSCC). As cannabinoid products become more utilized with the evolving legislature, we aim to utilize survey results to identify target areas of research in the head and neck cancer population. Study Design: Survey study. Methods: Participants were at least 21 years of age with a histologically or radiologically proven diagnosis of head and neck squamous cell carcinoma. Participants were asked to complete an electronic survey via REDCap one time during or after active treatment during March of 2022. Data collected included patient demographics, type of HNSCC, phase of treatment, cannabis use, and perceived symptom relief. Results: Of the 32 survey respondents 47% (15/32) reported that they use cannabis. In this population it is most commonly smoked or taken orally and over half of patients get their cannabis products recreationally. Patients used cannabis more frequently before their diagnosis and after treatment for HNSCC and have perceived benefit for both mental and somatic symptoms. Conclusions: In our study, we found that a significant proportion of patients surveyed with head and neck squamous cell carcinoma use cannabis. As federal laws continue to legalize the use of cannabis both medically and recreationally it is imperative that further research be done in the otolaryngologic community to better understand how to counsel patients.

170. Multimodal Virtual 3D Representation of Oral Tongue Cancer: A Case Study on the Feasibility of Combining Preoperative Virtual Reality Surgical Planning and Intraoperative ex vivo 3D Specimen Mapping

Richard Wu, MPH, Philadelphia, PA; Kayvon Sharif, BA, Nashville, TN; Victor Jegede, BS, Philadelphia, PA; Derek Mann, BS, Philadelphia, PA; Joseph Curry, MD, Philadelphia, PA; Michael Topf, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the potential impact of emerging 3D computer aided design (CAD) technologies for head and neck cancer surgery.

Objectives: Demonstrate the elements of the novel CAD margin protocol and its utility in head and neck cancer surgery and determine the feasibility of implement-

ing into a preexisting virtual reality (VR) surgical planning workflow. **Study Design:** Case report. **Methods:** A 70 year old male with a cT2N2b squamous cell carcinoma (SCC) of the oral tongue was scheduled for right hemiglossectomy. Preoperatively, CT DICOM files were uploaded to the Medical Holodeck software to generate an autosegmented 3D anatomic model which could then be viewed and manipulated in VR. Intraoperatively, a structured light 3D scanner (Einscan SP, Shining 3D) was used to capture the 3D surface topography of the fresh surgical specimen. CAD software (Autodesk Meshmixer) was used to annotate the sites of frozen sections onto the 3D model. Videoconferencing displayed the 3D model from the laboratory to the operating room (OR) in real time. **Results:** The 3D anatomic model in VR allowed for the surgeon to plan the case preoperatively. Intraoperative, image acquisition time for the 3D scan data was 7 minutes and 35 seconds. Frozen section diagnosis was delivered to the OR via videoconference providing visual anatomic cues of the site of margin sampling and live updates on margin status. Final pathology showed a 3.5cm SCC with 6mm depth of invasion. All resection margins were negative. **Conclusions:** Surgical planning in virtual reality may enhance surgeon understanding of patient anatomy and tumor morphology. Intraoperative 3D scanning of the surgical specimen may allow for visual guidance and improved communication of frozen section analysis results.

171. An Insidious Presentation of Primary Tracheal Adenoid Cystic Carcinoma: A Case Report and Analysis of the Tumor Immune Microenvironment Using Single Cell RNA Sequencing

Wenda Ye, MD, Nashville, TN; Sarah L. Rohde, MD MMHC, Nashville, TN; C. Alessandra Colaianni, MD MPhil, Portland, OR; Alexander H. Gelbard, MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the diagnosis and treatment of primary tracheal adenoid cystic carcinoma along with an overview of T cell receptor repertoire analysis using single cell RNA sequencing.

Objectives: Adenoid cystic carcinoma (ACC) is a slow growing yet aggressive malignancy most commonly originating from the salivary glands that has high rates of recurrence/metastasis. Here, we present a rare case of primary tracheal ACC treated with tracheal resection followed by concurrent chemoradiation. Immune profiling of intratumoral T cell receptor (TCR) repertoire was subsequently performed using single cell RNA sequencing (ssRNAseq). **Study Design:** Case report. **Methods:** Case report, literature review, and ssRNAseq of tumor specimen. **Results:** A 43 year old female presented for evaluation of progressive cervicalgia and globus sensation over a 6 month period. Fiberoptic examination of the larynx demonstrated intact vocal fold mobility with subtle fullness in the proximal posterior trachea. Subsequent CT/MRI imaging revealed a submucosal enhancing mass in the posterior tracheal wall inferior to the cricoid cartilage and operative biopsy demonstrated tumor cells arranged in tubular and cribriform patterns consistent with ACC. The patient underwent tracheal resection with removal of 6 rings and re-anastomosis. Final pathology was consistent with grade 1 ACC with tumor invasion close to the surgical margin, and the patient received adjuvant chemoradiotherapy. In addition, ssRNAseq of the tumor revealed predominant stromal and immune cell populations with 68 sequenced TCRs. Of these, the two largest clones each represented 4.4% of total TCR diversity. The patient is currently without evidence of disease 11 months after definitive treatment. **Conclusions:** Primary tracheal ACC is a rare malignancy most commonly treated with surgical resection and often

followed by adjuvant therapy. In this patient, TCR repertoire analysis demonstrated no evidence of a dominant TCR clone.

172. Postoperative Lower Extremity Doppler Enables Early Identification of Occult Deep Venous Thrombosis in Head and Neck Free Flap Patients

Victoria X. Yu, MD, New York City, NY; Kevin Lee, MD DDS, New York, NY; Emily Honzel, BM MM, New York, NY; Ogoegbunam Okolo, BA, New York, NY; Anuraag S. Parikh, MD, New York, NY; Scott H. Troob, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants will have an understanding of the field's current knowledge of rates and risk factors of postoperative venous thromboembolic events (VTE) among head and neck free flap patients.

Objectives: Patients who undergo free flap reconstruction may be at increased risk for postoperative VTE. We report the largest case series of head and neck free flap patients to undergo postoperative VTE screening with lower extremity (LE) doppler. Study Design: This is a single institution retrospective consecutive case series. Methods: We identified patients who underwent free flap reconstruction between January 2016 and August 2022. Starting in December 2016, patients underwent routine LE doppler on postoperative day (POD) 0/1, VTE prophylaxis, and early ambulation. If a deep vein thrombosis (DVT) was discovered, patients were started on therapeutic anticoagulation. Results: 166 free flaps were identified in 158 patients. 128 (77.1%) flaps were performed for reconstruction following cancer resection, and 38 (22.9%) flaps were performed for non-cancer indications. Six (3.6%) VTE events were identified, including three pulmonary embolisms (PE) and three DVT. All patients who developed VTE had undergone cancer surgery; four additionally had undergone prior cancer treatment. Average anesthesia times for patients with VTE versus those without were 618 and 540 minutes, respectively. Four VTE events (one PE and three DVT) occurred after implementation of the postoperative screening protocol. Among these, three DVT were identified in asymptomatic patients on screening LE doppler - a 1.9% (3/160) positive screening rate. One patient with VTE experienced donor site hematoma after initiation of therapeutic anticoagulation. Conclusions: Possible risk factors for postoperative VTE in this population include active cancer, prior cancer treatment, and longer anesthesia time. LE doppler holds potential as a screening tool for occult VTE in high risk patients.

173. Smoking Status and Post-Glossectomy Complications in Tongue Squamous Cell Carcinomas

Laura Yuan, BS, Newark, NJ; Avneet Randhawa, BS, Newark, NJ; Karandeep Singh Randhawa, BS, Newark, NJ; Christina H. Fang, MD, Newark, NJ; Annette Runge, MD, Innsbruck, Austria; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the relationship between smoking and post-glossectomy complications in lingual carcinomas.

Objectives: Glossectomy is an effective treatment for long term disease control

and survival in patients with oral tongue cancer. We investigated the association between smoking status and postoperative complications in patients with tongue squamous cell carcinoma (SCC) undergoing glossectomy. Study Design: Retrospective database study. Methods: This study used the 2005-2015 National Surgical Quality Improvement Program database. Current procedural terminology and International Classification of Diseases, Ninth Revision codes were used to identify patients with a primary diagnosis of tongue SCC and a primary procedure of complete, composite, or partial glossectomy. Prolonged length of stay (LOS) was defined as values greater than the 90th percentile of the sample. Chi square analyses and binary logistic regression were used to compare differences in demographics, comorbidities, and postoperative outcomes in smoking and nonsmoking cohorts. Results: 692 cases of glossectomy for tongue SCC met selection criteria. 509 patients identified as nonsmokers and 183 as smokers, with the majority being male (64.5%), White (81.1%), and 50-65 years of age (57.4%). Smoking status was associated with gender ($p=0.004$), age ($p<0.001$), obesity ($p<0.001$), dyspnea ($p=0.009$), and chronic obstructive pulmonary disease ($p=0.042$). Smokers had higher incidences of extended operation time (14.2% vs. 8.6%; $p=0.044$) and prolonged LOS (14.8% vs 7.9%; $p=0.009$). After adjusting for demographics and comorbidities, smoking status was associated with bleeding transfusion complications (OR 1.804; 95% CI 1.028-3.166; $p=0.040$) and unplanned reoperations (OR 1.901; 95% CI 1.018-3.549; $p=0.044$). Conclusions: Smoking is an important predictor of postoperative complications following glossectomy in patients with SCC of the tongue.

Laryngology/Bronchoesophagology

174. Suspicious Laryngeal Mass: A Case of Recurrent Mantle Cell Lymphoma

Jeffrey David Bernstein, MD, San Diego, CA; Andrew Vahabzadeh-Hagh, MD, San Diego, CA; Samuel Marcus, BA, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify laryngeal mantle cell lymphoma and understand the treatment and prognosis of this condition.

Objectives: To discuss a case of mantle cell lymphoma (MCL) of the larynx, a rare clinical entity in laryngology. Study Design: Case report. Methods: A 71 year old male presented to laryngology clinic with hoarseness, cough, and dysphagia with aspiration. His past medical history included diffuse stage IV mantle cell lymphoma. He had previously received systemic chemotherapy and after complete response on PET/CT, he had been in remission for 3 years. In-office laryngoscopy revealed a 2 cm smooth submucosal mass effacing the left arytenoid and occupying the piriform sinus. The patient was taken to the operating room for direct laryngoscopy, biopsy, and CO2 laser debulking of the mass. Results: The debulking procedure was technically successful and relieved some of the patient's upper airway symptoms. The pathology confirmed that this was a recurrence of mantle cell lymphoma, now manifested in the larynx. The patient was referred for repeated chemotherapy and did well. Conclusions: While primary MCL of the larynx has been reported, to our knowledge this is the first reported case of diffuse, non-laryngeal MCL recurring to the larynx. To further characterize this rare case, the incidence, subsites, presentation, appearance, genetics, and treatments of primary laryngeal lymphoma are discussed.

175. Assessment of Anatomic Changes in Age Related Vocal Fold

Atrophy: A Laryngostroboscopic Study

David James Cvancara, BS, Seattle, WA; Hans Baertsch, BA, Los Angeles, CA; Julio Alejandro de Leon, BS, Seattle, WA; Eric Hollenbaugh, BA, Seattle, WA; Anna Castiller, MS CF-SLP, Seattle, WA; Neel Kishor Bhatt, MD, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe some of the anatomic changes seen in ARVA from the lens of a laryngoscope.

Objectives: Age related vocal fold atrophy (ARVA) is a diagnosis that relies heavily on clinical interpretation with few studies attempting to associate ARVA with objective laryngostroboscopic findings. The primary outcome of this study was to describe quantitative anatomic changes seen in ARVA. Secondly, we were interested in determining if mobility of the cricoarytenoid joint was reduced with age. **Study Design:** Retrospective case control study. **Methods:** Still images were captured from laryngostroboscopic examinations (ARVA n=29, control n=26) at max vocal fold abduction and adduction. Two investigators individually collected and averaged eight anatomic domains using ImageJ including: max abduction angle (MAA), change in angle (CIA), normalized abduction arytenoid distance (NABA), normalized adduction arytenoid distance (NADA), change in normalized arytenoid distance (CNAD), normalized glottal gap area (NGGA), and bowing index (BI). CAPE-V scores were collected. T-tests were used to compare measures between groups. Pearson's correlation was used to evaluate associations between each measure and CAPE-V. **Results:** CAPE-V, BI, and NADA were significantly larger in patients with ARVA compared to controls ($p=0.0001$, $p=0.0096$, $p=0.035$, respectively). BI and NADA had significant positive correlations with CAPE-V (Pearson's $R=0.50$, $p=0.0005$, and $R=0.34$, $p=0.02$, respectively). Other measures did not significantly differ between groups. **Conclusions:** Compared to controls, patients with ARVA had marked dysphonia associated with significantly larger bowing and impaired arytenoid adduction. In this cohort, both static and dynamic comparisons of vocal fold angles did not appear to differ between groups and were not associated with dysphonia severity. Future studies should investigate longitudinal laryngostroboscopic changes seen in ARVA as it may help explain disease progression.

176. Quality, Readability, and Understandability of Online Posterior Glottic Stenosis Information

Julian S. De La Chapa, MD, Charlottesville, VA; Jeffrey R. Bellinger, BS, Charlottesville, VA; Allyson R. Timm, BS, Charlottesville, VA; James J. Daniero, MD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the quality, readability, and understandability of information available to posterior glottic stenosis patients online.

Objectives: Assess the quality, readability, and understandability of posterior glottic stenosis (PGS) information available to patients online. **Study Design:** Descriptive, correlational study. **Methods:** The top 50 Google search results for "posterior glottic stenosis" were categorized based on website affiliation and target audience (patient or provider). Readability was assessed using the Flesch-Kincaid Grade Level (FKGL) and the Flesch Reading Ease (FRE) scores. The DISCERN tool was used to assess quality and the Patient Education Assessment Tool for Printed

Materials (PEMAT-P) was used to assess understandability and actionability. Simple descriptive statistics were used to analyze the data. Results: 36 of the top 50 results were eligible for scoring. 17% (6 of 36) were classified as patient focused while 83% (30 of 36) were provider focused. Patient focused materials had a higher mean FRE score (36.9) than provider focused materials (15.5) ($P = 6.30 \times 10^{-6}$). Patient focused materials had an average reading level of 12.5 compared to 15.8 for provider focused materials ($P = 7.74 \times 10^{-4}$). There was a significant correlation between overall PEMAT-P and DISCERN ($r = 0.63$, $P = 3.45 \times 10^{-5}$), PEMAT-P understandability and DISCERN ($r = 0.63$, $P = 4.01 \times 10^{-5}$) and FRES and FKGL ($r = -0.67$, $P = 6.65 \times 10^{-6}$). Conclusions: Shared decision making in PGS management is crucial as patients must be aware of how treatment modalities affect airway, voice, and swallowing. However, this study shows that patient targeted PGS information is limited, and the readability, quality, and understandability is generally low.

177. A Novel Approach of Ultrasound Mediated Aspiration Detection in a Cadaver Model

Peng Ding, MD PhD, Cleveland, OH; Russell Fedewa, PhD, Cleveland, OH; Karl West, MSc, Cleveland, OH; Colleen K. Hyman, MEng, Cleveland, OH; Vivian Hua, BS, Cleveland, OH; Paul C. Bryson, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants will understand the perspectives of ultrasound (US) guided aspiration detection approach, parameters, and aspiration model in a cadaver.

Objectives: Pulmonary aspiration as a common phenomenon seen in the elderly patient population and dysphagic patients and can result in fatal complications like aspiration pneumonia, which accounts for the majority of senior patients hospitalized for pneumonia. Current diagnostic tools to detect aspiration are invasive or radiative. We proposed a novel approach that is noninvasive and nonradiative to explore the feasibility of aspiration detection in a cadaver model. Study Design: A cadaveric study was conducted to assess ultrasound sensitivity at detecting aspiration of liquids passing down the trachea. Methods: Flexible endoscopy (FE) attached to a liquid delivery tube was placed past the vocal cords to visualize and record aspiration event. Two liquid textures were delivered in ascending volumes from 1mL to 15 mL in sitting and Fowler's positions. An US probe was placed on the anterior and lateral locations of the neck and parameters were recorded in US device. Video generated from both US and FE was recorded concurrently while delivering liquid. Results: Liquid aspiration of all volumes and textures was not visible through ultrasound when the cadaver was placed in a supine position. In Fowler's position, liquid aspiration was detectable by ultrasound in both liquid textures although detection was inconsistent. Conclusions: Combating the high prevalence of aspiration in elderly and dysphagia patients will greatly improve their quality of life and reduce mortality risk following aspiration pneumonia. Traditional US device was found to be able to detect aspiration in certain positions but lacked effectiveness and reliability. Further exploration of novel US technology may hold much potential.

178. Evaluation and Management of Kaposi Sarcoma of the Larynx

Lane Bradley Donaldson, MD, Detroit, MI; Matthew Marget, MD, Detroit, MI; Lamont Jones, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants

should be able to recognize the clinical features of a patient presenting with Kaposi sarcoma involving the oral cavity and larynx, diagnose Kaposi sarcoma, and develop a multidisciplinary treatment algorithm.

Objectives: Kaposi sarcoma (KS) is a multifocal neoplastic vascular disorder with low grade malignant potential that arises from endothelial cells of the lymphatic and blood vessels. Initially described in 1872 by Moritz Kaposi, it subsequently received significant attention with the rise of the HIV/AIDS crisis in the 1980s due to its association with the disease. Within the HIV/AIDS populations KS is more diffuse and can be seen within the head and neck patient population with mucosal lesions often found in the oral cavity. Involvement of the larynx, however, is much less common. We present the case of an HIV positive 33 year old male who presented with 3-4 months of worsening dysphagia, dysphonia, and odynophagia with associated weight loss. Workup revealed lesions within the oral cavity and the larynx which were consistent KS on pathology. Further evaluation by the gastrointestinal team showing diffuse esophagitis and ulcers within the stomach and rectum also consistent with KS on biopsy. The patient was started on appropriate antiviral and antiretroviral therapy with multidisciplinary followup coordinated, however patient was lost to followup. Although rare, KS can present in both healthy and immunocompromised patients and should be considered on the differential diagnosis when examination reveals violaceous mucosal lesions. **Study Design:** Case report. **Methods:** Case report. **Results:** Case report. **Conclusions:** Laryngeal involvement of KS is rare but can potentially be significantly debilitating with impact on nutrition, voice and the airway. Although treatment for HIV/AIDS has improved over time, KS remains a potential complication despite adequate antiretroviral therapy. Options for treatment include localized therapy such as surgery and radiation or systemic therapy for certain patient populations.

179. Ultrasound Aided Resorbable Pin Placement for Rigid Fixation of a Thyroid Cartilage Fracture: A Case Report

Claudia Natalia Gutierrez, MD MS, Charlottesville, VA; Andrew Zaninovich, BE, Charlottesville, VA; Rebecca L. Vozzo, MEd LAT, Charlottesville, VA; James J. Daniero, MD MS, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should understand the presentation of laryngeal fractures after blunt trauma to the neck and the importance of early intervention due to the threat to airway patency and phonation. Participants should also understand management options including the use of an ultrasound aided resorbable pin system for rigid fixation.

Objectives: To present a case of a laryngeal fracture after blunt trauma to the neck and the feasibility of using the SonicWeld Rx, an ultrasound aided resorbable implant system developed by KLS Martin, for the rigid fixation of a thyroid cartilage fracture. **Study Design:** Case report. **Methods:** The presentation and management of laryngeal fractures was reviewed via PubMed. The patient's medical record, imaging, and operative reports were reviewed. **Results:** Case presentation of a 20 year old otherwise healthy male who experienced a high velocity injury to his left anterior neck via a lacrosse ball resulting in immediate aphonia and ecchymosis of his neck. CT imaging demonstrated a displaced paramedian right laryngeal cartilage fracture associated with dysphonia and odynophagia. Flexible nasolaryngoscopy demonstrated a patent airway and the patient was admitted for airway observation in preparation for rigid fixation. Intraoperatively, his fracture was plated using a Poly-D, L-Lactic Acid (PDLLA) polymer placed using the SonicWeld Rx

system. One week postop the patient reported a mildly rough voice with inability to elevate pitch. One month postop the patient reported a return to his vocal baseline. Conclusions: This case demonstrates the importance of early intervention of laryngeal fractures. It also highlights the use of an ultrasound aided resorbable pin system as a promising alternative to traditional metal plate and screw systems for the fixation of laryngeal fractures, allowing for rapid fixation and reestablishment of complex laryngeal form while optimizing the recovery of respiratory and phonatory functions.

180. Clinical Characteristics of the Cervical Inlet Patch: A Case Series

Christopher Harryman, MD, Charlottesville, VA; Julian S. De La Chapa, MD, Charlottesville, VA; Patrick O. McGarey, MD, Charlottesville, VA; James J. Daniero, MD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be familiar with the common clinical characteristics, treatment, and outcomes of patients with heterotopic gastric mucosa in the proximal esophagus.

Objectives: The cervical inlet patch (CIP) is a common congenital anomaly with unclear clinical implications. Many patients are asymptomatic; however, CIP may reveal itself during evaluation for other esophageal or laryngeal pathologies in the otolaryngologic setting. The goal of this study was to characterize the symptoms and outcomes of patients with symptomatic CIP. Study Design: Case series. Methods: Retrospective chart review was performed. Patient's demographics, comorbidities, prior workup, interventions, and response to treatment were recorded. Analysis was descriptive. Results: Eight patients (6 female) were followed for management of symptoms related to CIP. The mean age at presentation to our clinic was 64.9 (SD= 15.7). 5 of 8 patients presented with a chief complaint of dysphagia and three with chronic cough. 5 of 8 patients demonstrated findings of laryngopharyngeal reflux (LPR). Swallow study demonstrated hiatal hernia in 3 of 8 patients, and cricopharyngeal (CP) dysfunction in 4 of 8 patients. One patient presented with a history of Barrett's esophagus. Treatment included increased acid suppression therapy and management of coexisting esophageal pathologies. Ablative procedures were performed in five of eight cases, with two patients requiring repeat procedures. All patients experience subjective symptom improvement. Conclusions: CIP tends to present in complex patients with multifactorial dysphagia, with the most common symptoms being dysphagia and cough. This case series is the first to suggest a possible association between CP dysfunction and CIP. Additionally, these patients have a high prevalence of LPR, supporting previous studies that have shown an association between the two pathologies.

181. Cricoid Chondronecrosis after Intubation in the Setting of COVID-19: Case Series and Literature Review

Bailey N. Hassman, BS, Omaha, NE; Raluca T. Gray, MD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to describe diagnosis and treatment options for cricoid chondronecrosis.

Objectives: The objective of this study is to describe the presentation, diagnosis and treatment of cricoid chondronecrosis in the aftermath of intubation for COVID-19 treatment. Given that COVID-19 infections present a unique inflammatory and pro-

thrombotic state that may increase the risk of cricoid chondronecrosis, evaluation of available treatments and their effectiveness is essential to determining the most effective management regimen for these cases. These findings are particularly important as the number of previously intubated COVID-19 patients has increased dramatically since the onset of the pandemic, and providers must be aware of the various airway complications that may arise in this particular patient population. By presenting the precipitating factors and treatment outcomes of patients with cricoid chondronecrosis at this institution, we can continue to raise awareness of this condition and contribute to the growing body of literature examining effective treatment options, leading to better care for patients suffering from this diagnosis. Study Design: Retrospective chart review. Methods: Patients with a diagnosis of cricoid chondronecrosis were selected. Chart review was performed to identify patient demographics, comorbidities, intubation history, diagnostic testing and treatment history. Results: Nine patients, three males and six females, with median age of 59 years old (28-70 years) were intubated for a median of 17 days (7-30 days) and were found to have cricoid chondronecrosis on computed tomography imaging of the neck. Regarding comorbidities, 67% (6/9) patients had diabetes mellitus. 33% (3/9) were trach dependent at presentation. 33% (3/9) patients required emergency tracheotomy placement. All patients received multiple courses of medical treatment. Median number of surgeries were 2 per patient (range 0-3 procedures). Eleven percent (1/9) patients are not trach dependent after treatment. Conclusions: Cricoid chondronecrosis is a rare entity that should be on the differential diagnosis of airway stenosis post-intubation. The rate of trach dependence is high despite extensive medical and surgical interventions.

182. **Psychiatric Diagnoses and Psychotropic Medication Usage Among Patients Undergoing Gender Affirming Voice Surgery**

Sara B. Hobday, BA, Philadelphia, PA; Natasha Mirza, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be aware of the most common psychologic disorders and psychotropic medications prescribed among patients who have undergone gender affirming voice surgery.

Objectives: To describe the prevalence of psychiatric illness and psychotropic medication usage among the subset of transgender patients who undergo gender affirming laryngeal surgery and describe some of the most commonly encountered conditions experienced by this population. Study Design: Case series including seventeen patients who underwent gender affirming laryngeal procedure from August 2019 to June 2022 performed at a single institution. Methods: An IRB approved chart review was conducted for the seventeen patients who have undergone gender affirming laryngeal procedures, and psychiatric diagnoses and prescriptions for psychotropic medications were recorded. Results: Of the seventeen patients who underwent gender affirming laryngeal surgery at this institution, fourteen patients underwent these operations as part of a transition from male to female gender, while three patients were transitioning from female to male gender. In this cohort, thirteen patients were diagnosed with a psychiatric comorbidity (76.5%). Of these patients, eleven were prescribed at least one psychotropic medication (65.7%). The most common psychiatric illnesses encountered in these patients were depression, anxiety, and post-traumatic stress disorder. Nine patients were diagnosed with more than one psychiatric comorbidity (52.9%). The most commonly prescribed psychotropics were SSRIs/SNRIs and anticonvulsants.

Three patients in this cohort had a recorded history of at least one prior suicide attempt. Conclusions: Multiple studies have demonstrated increased rates of mental illness in transgender individuals, however, this is the first study to describe the prevalence of these conditions specifically in the subset of patients who undergo gender affirming laryngeal surgery.

183. Optimizing Transport Survivability of Muscle Derived Cells for Laryngeal Injection

Samuel Louis Kaefer, BA, Indianapolis, IN; Lujuan Zhang, MD, Indianapolis, IN; Sarah Brookes, DVM PhD, West Lafayette, IN; Sherry Voytik-Harbin, PhD, West Lafayette, IN; Stacey Halum, MD FACS, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the optimal conditions to allow for viable cell transport in preparation for cellular therapy translational applications.

Objectives: To describe the impact of transport characteristics including culture medium, duration of storage, and temperature on injectable motor endplate expressing muscle cell viability and gene expression. Study Design: Basic science. Methods: Muscle progenitor cells (MPCs) isolated from adult Yucatan pig muscle biopsies were cultured and induced to create motor endplate expressing cells (MEEs). Following the identification of a suitable minimally supplemented storage medium, MEEs were suspended at a constant concentration in plastic syringes. Cell suspensions were subjected to storage conditions of varying temperatures (4, 22, or 37 C) and durations (6, 18, 24, or 48 hours), which was followed by statistical analysis of final cell viability. Storage conditions that had maintained high cell viability (acceptable for cellular therapy) were examined via Q-PCR to assess retained expression of angiogenic, neurotrophic, and myogenic genes. Results: Cell viability was impacted by storage temperature. Cell survival was also influenced by storage duration. Cell death rate differed as a result of temperature alone (ANOVA single factor, p less than 0.05), however, there was no statistical difference in cell death rate based on storage duration alone (ANOVA single factor, p equals 0.0829). Characterized cell samples within differing microenvironments yielded different gene expression profiles. Conclusions: Storage medium, duration, and temperature must be considered during the transport of injectable muscle cells as they can alter cell viability and gene expression. These described factors are integral in the planning of general cell transport and may prove equally important when the cell population utilized for laryngeal injection is derived from a patient's own initial muscle biopsy.

184. Effects on Swallow after Bilateral Injection Laryngoplasty for Age Related Vocal Atrophy

Douglas M. Kempthorne, BS, Seattle, WA; Hans C. Baertsch, BA, Los Angeles, CA; Neel K. Bhatt, MD, Seattle, WA; John Paul Giliberto, MD, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the effects on swallowing function following bilateral injection laryngoplasty in patients with age related vocal atrophy who are primarily treated for dysphonia.

Objectives: Bilateral vocal fold injection laryngoplasty is sometimes performed to treat patients with age related vocal atrophy (ARVA). However, improvements in swallow after bilateral injection laryngoplasty for ARVA have not been well described. The purpose of this study was to review changes in swallow function after bilateral injection laryngoplasty in patients with ARVA. **Study Design:** Retrospective cohort. **Methods:** We reviewed patients with ARVA who received in-office bilateral injection laryngoplasty (n=21). **Exclusion criteria:** vocal fold scar, laryngeal cancer, vocal atrophy following neurodegenerative disease, prior laryngeal surgery including injection laryngoplasty, history of larynx radiation, and intubation in last 3 months. Improvement in voice and swallow were measured pre- and post-injection using the Eating Assessment Tool-10 (EAT-10) and Voice Handicap Index-10 (VHI-10). Pre- and post-injection stroboscopy was reviewed to analyze the improvement in bowing index (BI). **Results:** Average followup was 2.57 (SD=1.51) months. The mean EAT-10 pre- and post-injection was 5.1 and 3.3, respectively (p=0.15). The mean VHI-10 pre- and post-injection was 20.9 and 21.2, respectively (p=0.85). The mean decrease in the BI was 2.7 (95% CI:0.3-5.1, n=11). **Conclusions:** Bilateral injection laryngoplasty is sometimes performed in patients with ARVA; however, improvements in swallow function have not been well studied. This study suggests that bilateral injection laryngoplasty may provide modest improvement in swallowing among those seeking treatment for dysphonia and vocal atrophy, although this improvement was not statistically significant in this study. Future prospective studies may help to identify which factors in patients with ARVA predict benefit from injection laryngoplasty for both voice and swallowing complaints.

185. **Toxicology of Inhaled Fosamprenavir as a Dry Powder for Laryngopharyngeal Reflux**

Alexandra Mae Lesnick, BS, Milwaukee, WI; Tina Samuels, MS, Milwaukee, WI; Frank Ondrey, MD, Minneapolis, MN; Timothy S. Wiedmann, PhD, Minneapolis, MN; Chris Hogan, PhD, Minneapolis, MN; Nikki Johnston, PhD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand pre-GLP inhalation toxicology of fosamprenavir for a dry powder inhaler (DPI) for laryngopharyngeal reflux.

Objectives: More than 20% of the US population suffer from laryngopharyngeal reflux (LPR) with no effective medical therapy. Fosamprenavir, which binds to and inhibits pepsin, holds promise for the treatment of LPR. The objective is to develop a dry powder inhaler for local delivery, allowing lower dosing. **Study Design:** In vivo translational. **Methods:** A small scale powder disperser was used to generate aerosols of fosamprenavir and the mass distribution measured optically. A preliminary toxicity study was conducted in mice at inhaled dose levels of 0.5X, X, and 2X, where X represents the inhaled dose that was used to achieve efficacy in our earlier study (0.93mg/kg/day). Organ pathology was documented and 14 relevant biomarkers (GM-CSF, IFN γ , IL-1 α , IL-1 β , IL-2, IL-4, IL-5, IL-6, IL-7, IL-10, IL-12p70, IL-13, IL-17A, KC/CXCL1, LIX, MCP-1, MIP-2, TNF α) measured in bronchiolar lavage (BAL) samples. **Results:** A particle size range of 2-9 μ m represents the best choice in terms of higher deposition fraction in the larynx and lower deposition elsewhere in the respiratory tract. No pathology was seen in the nasal cavity, larynx, esophagus, trachea, lung, liver, and kidney tissues from either control or fosamprenavir exposed mice. Inflammation was seen in the heart of 1/15 fosamprenavir treated mice. Only one comparison of the biomarkers in BAL samples was significant: IL-6 between control and 0.5X (p = 0.018). **Conclusions:** Given the

benefits of local treatment direct to the site of injury (allowing lower dosing limiting systemic side effects), these preliminary toxicology safety data justify GLP inhalation toxicology necessary for phase I clinical trial.

186. Ventilation Pressures in Aluminum Wrapped Silicone and Stainless Steel Wire Laser Resistant Endotracheal Tubes

Jessica Mesou Lin, AB, Charlottesville, VA; Adithya Reddy, BSE, Charlottesville, MA; Lucy Fitzgerald, BS, Charlottesville, VA; Daniel Quinn, PhD, Charlottesville, VA; James J. Daniero, MD MS, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participant should be able to identify differences in patient ventilation characteristics and fluid flow characteristics between a traditional stainless steel laser resistant endotracheal tube and an aluminum wrapped smooth silicone design laser resistant endotracheal tube.

Objectives: A laser resistant endotracheal tube (ETT) with a smooth silicone design may reduce airway resistance and decrease risk of lung injury. This study investigates the differences in air flow characteristics between traditional stainless steel wire and aluminum wrapped silicone laser resistant ETTs. **Study Design:** Retrospective chart review and in vitro fluid flow analysis of a benchtop human airway simulation. **Methods:** Anesthesia records of thirty-two patients undergoing laser airway surgery were assessed, split evenly between stainless steel and silicone ETTs. Patients with comorbid lung disease were excluded. Ventilation variables, including average peak inspiratory pressures (PIP) and peak plateau pressures (PPLAT) measured midprocedure, were compared with Mann-Whitney U tests. In vitro testing was performed using an in-house benchtop setup with a motor driven piston simulating oscillating airflows of a human airway. In this setup, ventilation pressures were measured in polyvinyl chloride (PVC), PVC microlaryngoscopy, stainless steel, and silicone ETTs ranging from 5.0 to 6.0 mm (inner diameter) in size. **Results:** In chart review, no demographic differences were found between the two patient populations. There was significantly lower PIP (24.9 vs 32.4 cm H₂O, p=0.0098) and PPLAT (23.1 vs 30.3 cm H₂O, p=0.0142) in patients intubated with silicone ETTs. In flow analysis, the silicone ETTs required lower ventilation pressure than identically sized stainless steel tubes. **Conclusions:** This study demonstrates that a smooth silicone tube design is preferable over that of traditional tubes, as it requires lower peak inspiratory and plateau pressures and creates less airflow resistance.

187. Factors Associated with Successful Use of Electrolarynx following Total Laryngectomy: A Multi-Institutional Study

Cassie Pan, MD, Seattle, WA; Leah Andrews, BA, Seattle, WA; Emily Johnson, MS CCC-SLP, Seattle, WA; Zain H. Rizvi, MD, Seattle, WA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify clinical characteristics associated with successful use of the electrolarynx after total laryngectomy.

Objectives: To identify characteristics associated with successful electrolarynx (EL) use after total laryngectomy (TL). **Study Design:** Multi-institution retrospective cohort study. **Methods:** Records of 196 adults who underwent TL from

03/15/2012ΓÇö03/15/2022 were reviewed. Characteristics included age, Charlson Comorbidity Index (CCI), social support, preoperative radiation (RT) or chemoradiation (chemoXRT), and post-TL swallow status. EL success was evaluated using predefined criteria of intelligibility, reliability, and independence with use. Poisson regressions and robust standard error estimates were used to estimate unadjusted risk ratios for each characteristic. Statistically significant characteristics were included in multivariate analysis (MVA) to estimate adjusted risk ratios. Results: Median age was 64 (range 37-92), median CCI was 5 (range 0-11), 170 (87%) were male, 159 (81%) had consistent social support, and 159 (81%) attained a full oral diet post-TL. Preoperatively, 110 (56%) had RT, including 55 (28%) with concurrent chemotherapy. Ninety-three (47%) met our criteria for EL success. Variables significantly associated with EL success included social support ($p=0.037$) and full oral diet post-TL ($p=0.037$), and both approached significance on MVA. EL success varied by preop treatment on univariate ($p=0.005$) and MVA ($p=0.014$). Interestingly, compared to no prior RT or chemoXRT, probability of EL success was 29% higher with prior RT and 29% lower with prior chemoXRT in the MVA. Conclusions: This retrospective review showed that EL success correlated with presence of social support, preop RT, and full oral diet post-TL. These results warrant validation in a larger prospective study to help guide choice of voice rehabilitation modalities or intensified speech therapy.

188. **Multi-Disciplinary Management of Cough: Identifying Gaps in Best Practice**

Priscilla F.A. Pichardo, DO, Danville, PA; Kenneth W. Altman, MD PhD, Danville, PA; Amanda J. Young, MS, Danville, PA; Mudit Gupta, MS, Danville, PA; Melissa A. Troup, MHSA, Danville, PA; Jackie Blank, MBA, Danville, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify the specialties playing a significant role in the management of cough and the role that otolaryngology plays. Additionally, participants should be able to describe gaps in best practice identified in management of cough.

Objectives: Investigating the cough population is crucial to addressing gaps in education and best practice. The aim of this study is to identify medical specialties treating cough patients with the hypothesis that over time there has been an increase in the number of specialties involved in these patients' care. This helps create a platform for education of new developments in the management of cough. **Study Design:** A retrospective review. **Methods:** Patients coded with ICD-9 786.2 or ICD-10 R05 from January 1, 2001, through December 31, 2020, were reviewed. Inclusion criteria were 1 or more visits for cough. Encounters were characterized by specialty and then stratified by year. **Results:** There were 625,174 unique encounters for cough, among 61 departments. In 2001, 5,795 visits were utilized for treating cough, with otolaryngology accounting for 15 encounters. The rate of cough encounters increased with 30,780 total cough encounters in 2020, an 8.7% increase over 20 years. Otolaryngology had 450 encounters in 2020, increasing by 18.5% over 20 years. Family medicine, pediatrics, and urgent care had the highest number of overall cough encounters with the distribution of encounters being 39.7%, 19.0%, and 10.2% respectively. Despite the important role of otolaryngology in treating cough, less than 1% of encounters were completed by an otolaryngologist. **Conclusions:** We demonstrate an increase in the number of cough encounters over 20 years with a growth of otolaryngologists treating this population. This study demonstrates the need for educating specialties managing cough,

specifically chronic cough and the utilization of the new ICD-10 code going forth.

- 189. Mapping Genetic Susceptibility to Stenosis in the Proximal Airway**
 Kayvon Sharif, BA, Nashville, TN; William S. Tierney, MD, Nashville, TN;
 Alexander T. Hillel, MD, Baltimore, MD; Marisol Ramirez-Solano, MS,
 Nashville, TN; Quanhu Sheng, PhD, Nashville, TN; Alexander Gelbard,
 MD, Nashville, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to describe emerging bioinformatics approaches to uncover genetic susceptibility, biological pathways, and cellular mechanisms implicated in the pathogenesis of subglottic stenosis.

Objectives: Recent translational scientific efforts in subglottic stenosis (SGS) support a disease model where subglottic epithelial alterations facilitate microbiome displacement, dysregulated immune activation, and localized fibrosis. Yet despite recent advances, the genetic basis of SGS remains poorly understood. We sought to identify candidate risk genes associated with an SGS phenotype, investigate their biological function and identify the cell types enriched for their expression. **Study Design:** Multiplatform exploratory bioinformatics analysis. **Methods:** The Online Mendelian Inheritance in Man (OMIM) database was queried for single gene variants associated with an SGS phenotype. The functional intersections and molecular roles of the identified genes were explored using pathway enrichment analysis (PEA) computational methods. Cellular localization and differential expression of the candidate risk genes was measured via transcriptional quantification in an established single cell RNA sequencing (scRNA-seq) atlas of the proximal airway. **Results:** 20 genes associated with SGS phenotype were identified. PEA resulted in 12 significantly enriched terms including “cellular response to TGF-beta”, “epithelial to mesenchymal transition”, and “adherens junctions”. Mapping the 20 candidate risks genes to the scRNA-seq atlas found 3 (15%) genes were enriched in fibroblasts, 3 (15%) in epithelial cells, and 3 (15%) in endothelial cells. 11 (55%) were expressed ubiquitously among tissue types. Interestingly, no significant expression of candidate risk genes was observed among immune cells. **Conclusions:** We identify and provide biologic context for 20 genes associated with an SGS phenotype. These results offer new insights into the genetic architecture underlying fibrotic disease of the proximal airways and form the foundation for future detailed genetic study.

- 190. Predictors of Clinical Outcomes in Subglottic Stenosis**
 Eshita Singh, MD, Miami, FL; Haley Michele Hullfish, BS, Miami, FL;
 Aaron Joseph Fils, BS, Miami, FL; Ruixuan Ma, MS, Miami, FL; David E.
 Rosow, MD FACS, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to review the characteristics of patients with subglottic stenosis, understand the clinical course of subglottic stenosis, and identify risk factors for long term tracheostomy dependence.

Objectives: To review characteristics and outcomes of patients with diagnosis of subglottic stenosis; to identify risk factors for long term tracheostomy dependence. **Study Design:** Retrospective chart review. **Methods:** A retrospective chart review was performed on 215 patients diagnosed with subglottic stenosis from 10/10/2011 to 11/22/2020. Patients were grouped based on the cause of subglottic stenosis

(iatrogenic, idiopathic, cancer, autoimmune, unknown). Patient factors were compared to evaluate risk factors for long term tracheostomy dependence. Results: Of the 215 patients, 129 (60%) were classified as iatrogenic, 41 (19%) idiopathic, 10 (4.7%) cancer treatment, 18 (8.3%) autoimmune, and 17 (8%) patients unknown. Iatrogenic and cancer patients were more likely to be tracheostomy dependent. The risk of mortality did not significantly differ amongst the categories. Significant improvement was seen after treatment as the median percent of stenosis at presentation was 52.5%, and the median percent of stenosis at the most recent visit was 10% ($p < 2.2e-16$). Length of stenosis also significantly decreased with a median of 1.55cm at first operation compared to 1.0cm at last ($p = .024$). The autoimmune group received more steroid injections (mean = 6.55; SD = 11.96). The idiopathic group had a longer surgery free interval (mean = 30.8 months; SD = 27.7). Conclusions: Iatrogenic and cancer patients were more likely to be tracheostomy dependent. The risk of mortality does not differ among the different categories of subglottic stenosis. There was a significant improvement in percent and length of stenosis. The idiopathic group had the longest surgery free interval.

191. **Characterizing Patient Questions about Spasmodic Dysphonia: A Big Data Approach**

Guy Talmor, MD, Newark, NJ; Christopher Tseng, MD, Hershey, PA; Aatin Dhandra, BS, Newark, NJ; Julia Nguyen, BS, Newark, NJ; Boris Paskhover, MD, Newark, NJ; Rachel Kaye, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the most common patient questions and concerns regarding spasmodic dysphonia and be able to develop targeted educational materials for use by patients.

Objectives: The phonatory impairment resulting from spasmodic dysphonia (SD) may have detrimental effects on quality of life. Given the rarity of this disorder, educational resources regarding the diagnosis and treatment of SD may not be readily accessible. The objective of this study is to characterize patient questions regarding SD in order to develop targeted educational materials. Study Design: Cross-sectional study. Methods: Questions regarding the presentation and treatment of SD were gathered from the spasmodic dysphonia bulletin board website using an automated web crawler. Each question was reviewed by the authors and characterized into a category that best described the overall theme of the question. A machine learning approach was used to determine the 10 most common questions. Results: 568 questions pertaining to SD were collected. The most common categories included means of obtaining emotional support ($n=129$, 22.7%), botulinum toxin injection logistics ($n=116$, 20.4%), alternate treatments to injections ($n=80$, 14.1%), pathophysiology and symptomatology ($n=59$, 10.2%), physician recommendations ($n=36$, 6.3%), treatment costs ($n=28$, 4.9%), behaviors allowed ($n=21$, 3.7%) and voice therapy ($n=9$, 1.6%). Another 90 questions (18.8%) did not fit a specific category and were described as miscellaneous. Using machine learning, a list of the 10 most common questions was compiled. Conclusions: Spasmodic dysphonia may have significant adverse effects on patient quality of life. The most frequent patient query regarding SD related to the presence of support groups, highlighting the need for such forums. Other frequent queries mainly pertained to treatment options, including further detail regarding botulinum toxin injections as well as alternate treatment modalities.

192. **Tracheostomy Related Pressures on the Anterior Neck Skin and a**

Novel Device to Reduce This

Andrew M. Vahabzadeh-Hagh, MD, San Diego, CA; Shiv H. Patel, BSE, San Francisco, CA; Luke Lindenmuth, BSE, San Diego, CA; Zeyu Feng, BSE, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how tracheostomy related pressure ulcers occur and the quantitative forces exerted on the anterior neck skin despite best practices.

Objectives: Tracheostomies may result in pressure injuries on the anterior neck skin. Research efforts into prevention of these pressure injuries has resulted in specialized clinical care teams and pathways. While these efforts are useful, they are expensive, labor intensive, and not focused to eliminate the root cause of these pressure injuries; namely, pressure at device skin interface. Here for the first time, we measure that pressure directly and introduce a novel medical device, the tracheostomy support system (TSS), to minimize this pressure. **Study Design:** Cross-sectional study of 21 patients in the intensive care unit (ICU). **Methods:** We focused on patients in the intensive care unit (ICU) each with a tracheostomy tube connected to circuit tubing. A force sensing resistor (FSR) was used to measure baseline pressures at the device skin interface along the inferior flange of the tracheostomy tube. This pressure was then measured again with use of the tracheostomy support system in the inactive and active states. Resultant pressures and demographics were compared. **Results:** 15 male and 6 female patients with an average age of 47 years old [20, 66] were included in this study. Average pressures at the tracheostomy skin interface at baseline in these 21 ICU patients were 36.4 +/- 15.3 kilopascal (kPa). Average pressures were reduced with the active tracheostomy support system to 18.7 +/- 11.3 kPa ($p < 0.05$). All subjects tolerated the TSS without issue. **Conclusions:** Despite best clinical practice and heightened clinical vigilance, the root cause of tracheostomy related pressure injuries, pressure along the inferior flange, can remain quite high. Here we provide measures the pressure at the tracheostomy skin interface directly and show that a novel tracheostomy support system can be highly effective at minimizing that pressure.

193. A Novel Low Cost Training Model for Laryngotracheal Reconstruction

Lekha V. Yesantharao, BS, Baltimore, MD; Danielle R. Trakimas, MD MSE, Baltimore, MD; Jonathan Walsh, MD, Baltimore, MD

Educational Objective: Open airway surgeries, such as laryngotracheal reconstruction (LTR), are high acuity procedures that require complex techniques and unique instrumentation. Advanced training is essential for optimal patient outcomes, but decreasing rates of laryngotracheal stenosis have further limited trainees' exposure to this already infrequent procedure. Simulation models provide an effective, low risk alternative for surgical training. At the conclusion of this presentation, participants will have learned about a novel, low cost simulation model that has been developed to introduce trainees to LTR in a safe and accessible environment.

Objectives: This study describes a novel, low cost simulation model that has been developed to introduce otolaryngology trainees to laryngotracheal reconstruction (LTR); existing LTR models are additionally compared/contrasted. **Study Design:** Case report. **Methods:** Beef tracheas were rehydrated in water to model human tracheas. Rutabagas were used to simulate costal cartilage; the outer surface with intact skin represented the surface of the cartilage with perichondrium attached.

Anterior and posterior grafts were carved from the rutabaga. Defects were made in the anterior and posterior aspects of the trachea model, and trainees practiced sewing in the rutabaga grafts using the same suturing techniques used in live LTR. The model was evaluated for face validity. Results: Rehydrated beef tracheas effectively simulated human tracheas and allowed trainees to make anterior and posterior tracheal defects. The firm yet flexible texture of rutabaga effectively simulated costal cartilage and maintained its integrity throughout the simulation, allowing trainees to practice carving grafts and sewing grafts into the defects. Other models for LTR have been described; approximately 10 studies used 3D printed materials, which require expensive equipment and ~20 hours for printing/processing and approximately 80 studies used animal models such as pig or rabbit, which pose additional ethical, safety and financial barriers. The unit cost of our model was less than \$1.50 with minimal preparation time and did not require additional equipment or facilities, making it highly accessible for trainees. Conclusions: This study demonstrates a novel, low fidelity model to introduce trainees to LTR that is effective, low cost, ethical, and requires minimal preparation time. Future work will further assess model validity.

194. COVID-19 Related Tracheal Stenosis Requiring Tracheal Resection: A Case Series

Andrew Yousef, MD, San Diego, CA; Isaac Solomon, BS, San Diego, CA; George Cheng, MD PhD, San Diego, CA; Samir Makani, MD, San Diego, CA; Joshua A. Boys, MD, San Diego, CA; Philip Weissbrod, MD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to better characterize the risk factors for development and intraoperative findings associated with symptomatic tracheal stenosis due to COVID-19 requiring tracheal resection.

Objectives: To characterize the risk factors for development, intraoperative findings, and outcomes of tracheal resection in patients with symptomatic tracheal stenosis due to COVID-19. **Study Design:** Retrospective chart review. **Methods:** We performed a database search to identify all patients with tracheal stenosis secondary to COVID-19 receiving a tracheal resection between January 2020 and June 2022 at a single institution. Clinical and surgical characteristics were evaluated to characterize the risk factors and intraoperative findings. **Results:** There were 9 patients included. The mean age was 52 with 56% female. Patients were hospitalized for a median of 45.5 days related to COVID-19 with a median intubation time of 17 days. Tracheostomy was completed in 8 (89%) patients. Endoscopic interventions were attempted in 7 patients (78%) prior to resection with a median time to symptom recurrence of 16 days. At time of resection, the median tracheal resection length was 3.4cm. All patients underwent mediastinal release, with additional releasing maneuvers for longer resections which included thoracoscopic hilar release (3/9) and suprahyoid release (5/9). Patients were hospitalized for a median of 9 days postoperatively with no grade III or higher Clavien-Dindo postoperative complications. Median postoperative followup time was 112 days. **Conclusions:** Symptomatic tracheal stenosis due to COVID-19 is not well documented. In this population, the combination of extended intubation and subsequent tracheostomy was present in most cases. Stenotic segments tended to be on the longer side, many of which required releasing procedures. In this series, surgical resection of tracheal stenosis after COVID-19 is safe with excellent outcomes.

- 195. Partial Decellularization Preserves Tracheal Matrisome Integrity**
Jane Yu, BS, Columbus, OH; Lumei Liu, PhD, Columbus, OH; Sayali Dharmadhikari, MS, Columbus, OH; Julian Aldana, MS, Columbus, OH; Zheng Hong Tan, BS, Columbus, OH; Tendency Chiang, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how our partially decellularized tracheal graft (PDTG) preserved native tracheal proteins in the extracellular matrix (ECM) as well as their integrity. This contributes to that PDTG preserved mechanical property to support trachea regeneration.

Objectives: Decellularization is an approach of creating tissue engineered scaffolds for organ replacement. Approaches using decellularization for the trachea are complicated by losses in graft mechanical properties. We developed a partially decellularized tracheal graft (PDTG) and found that they maintain graft patency and support host derived epithelialization. Using mass spectrometry, we quantify the effect of partial decellularization on individual and global protein integrity of the tracheal matrisome. Study Design: Trachea replacement, tissue engineered trachea, regenerative medicine, animal model. Methods: Native trachea (NT) were harvested from 6–8 week old C57BL/6J mice and PDTG were created. PDTG were compared to NT histologically for decellularization efficiency and major protein preservation. The integrity of proteins isolated from NT and PDTG were quantified by mass spectrometry and the calculation of individual protein integrity scores (iPIS) and global protein integrity numbers (PIN). (N=5/group). NT and PDTG were then implanted in syngeneic hosts to evaluate in vivo performance for 2 weeks, 1 month and 3 months. Results: Partial decellularization was found histologically to remove all cellular components except for chondrocytes, and preserved collagens and glycosaminoglycans. Mass spectrometry of PDTG revealed the preservation of major ECM proteins (e.g., collagen, glycosaminoglycans, fibronectin, and laminin), with concurrent removal of intracellular proteins ($p < 0.05$). The global proteomic integrity was preserved in PDTG as PIN and major iPIS were similar in NT and PDTG (p greater than 0.05) Animals with PDTG showed similar survival rates [PDTG=93% (56/60); NT=92% (46/50)] and graft patency. Conclusions: Partial decellularization preserves tracheal ECM proteins and their respective integrity. PDTG in vivo remains patent and exhibits high survival following orthotopic tracheal transplant.

Otology/Neurotology

- 196. Biological Sex: A Factor in Adverse Outcomes following Otologic Surgery?**

Owais M. Aftab, BS, Newark, NJ; Karandeep S. Randhawa, BS, Newark, NJ; Avneet Randhawa, BS, Newark, NJ; Imran M. Khawaja, BA, Newark, NJ; Yu-Lan M. Ying, MD, Newark, NJ; Jean Anderson Eloy, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of sex and its association with complications following otologic surgery.

Objectives: Otologic surgery is performed for the management of pathologies related to hearing, the middle ear, and/or the mastoid. We analyzed the association between sex and outcomes in patients undergoing otologic surgery (OS). Study Design: Retrospective database review. Methods: This retrospective cohort analysis

utilized the 2015-2017 National Surgery Quality Improvement Program (NSQIP) database. Current procedural terminology (CPT) codes were used to identify OS cases with a primary procedure of tympanoplasty, tympanomastoidectomy, revision tympanomastoidectomy, revision mastoidectomy, and radical mastoidectomy. Demographics, comorbidities, and complication incidences were compared between male and female patients using chi square analyses. The independent effect of sex on adverse outcomes was analyzed using binary logistic regression. Results: 3,376 (52.8%) female and 3,017 (47.8%) male patients undergoing OS were identified from 2015 to 2017. Comorbidities differed as males had higher incidences of smoking (20.7% vs. 14.8%; $p < 0.001$) and poor functional status (1.0% vs. 0.5%; $p = 0.027$). Additionally, cohorts significantly differed by age ($p = 0.010$) and race ($p < 0.001$). Unadjusted chi square analyses showed males had a higher incidence of prolonged operation time. After adjusting for patient demographics and comorbidities, logistic regression analyses indicated male patients had decreased odds of superficial incisional surgical site infections (OR 0.402; 95% CI 0.177-0.912; $p = 0.029$) and increased odds of prolonged operation time (OR 1.483; 95% CI 1.230-1.788; $p < 0.001$) compared to female patients. Conclusions: Biological sex may be an important factor in OS associated as males have a decreased odds of superficial incisional surgical site infections and increased odds of prolonged operation time.

197. Cochlear Implantation in the Very Elderly

David Ahmadian, BS, Tucson, AZ; Brittany Michelle Chy, BS, Tucson, AZ; Nicholas A. Dewyer, MD, Tucson, AZ

Educational Objective: At the conclusion of this presentation, the participants should be more aware of the safety and effectiveness of cochlear implantation in the very elderly.

Objectives: Awareness amongst patients and providers about the efficacy and safety of cochlear implantation (CI) for the very elderly (VE) is lacking. This study describes a cohort of VE patients who underwent CI with a focus on their age, comorbidities, perioperative complications, and hearing outcomes. Study Design: Retrospective cohort analysis. Methods: A retrospective chart review was performed for all patients who underwent CI by a single surgeon at a tertiary academic center from 9/1/19 - 2/28/22. Patients 80 years or older at time of CI were considered VE and included in the study. Results: 10 patients met inclusion criteria. 5 were age 80 - 85 years at time of CI, 3 were 86 - 90, 1 was 91 - 95, and 1 was > 95. Indications for CI were bilateral sensorineural hearing loss (SNHL) in 9 and asymmetric SNHL in 1. 9 received their first implant and 1 received revision CI. Comorbidities included atrial fibrillation, HLD, HTN, CAD, CVA, anemia, prediabetes, aortic stenosis, and cardiomyopathy. 8 were on chronic anticoagulation medication; 3 continued these medications during the perioperative period. Perioperative complications were minor and included mild imbalance, tear in ear canal skin, tear in tympanic membrane, nausea, and pain. At 3 - 6 months, 90% reported improvements in hearing. Mean increase for AZIQ score for implanted ear was 41.3%, 95% CI [19.9, 62.7] (SD = 26.7). Conclusions: CI in the VE is safe and effective. Increasing awareness that there is no age that is "too old for cochlear implant surgery" likely would result in better treatment for many patients.

198. The Utility of Routine Preoperative Computed Tomography in Patients with Otosclerosis

David Ahmadian, BS, Tucson, AZ; Nicholas A. Dewyer, MD, Tucson, AZ

Educational Objective: At the conclusion of this presentation, the participants should be aware of the potential utility of preoperative CT imaging for patients with presumed otosclerosis.

Objectives: Recently, increased attention has been placed on identifying patients with superior semicircular canal dehiscence (SSCD) that is misdiagnosed as or occurs concurrently with otosclerosis. This study evaluated the utility of routine preoperative CT in patients with presumed otosclerosis. **Study Design:** Retrospective cohort analysis. **Methods:** A retrospective chart review was performed for patients treated by a single neurotologist at a tertiary academic medical center from 9/1/19 to 06/14/22. Inclusion criteria were patients who had a clinical diagnosis of otosclerosis and CT imaging. CT scans were reviewed for evidence of otosclerosis, SSCD, or other findings that may account for a conductive hearing loss. CT findings and clinical outcomes of interventions were described. **Results:** Of 36 patients with presumed otosclerosis, 20 (56%) had imaging findings suggestive of otosclerosis. 2 (6%) were found to have SSCD, 1 with concurrent otospongiosis and 1 without. The patient with SSCD and concurrent otosclerosis was counseled on the additional risks of incomplete closure of his air bone gap and unmasking SSCD symptoms. He underwent uncomplicated laser stapedotomy with a good result and no unmasking of SSCD symptoms. The other patient with SSCD also had imaging findings of a tegmen dehiscence with temporal lobe meningoencephalocele resting on the heads of the ossicles. Audiologic evaluation showed absent acoustic reflexes bilaterally. The patient elected for treatment with a unilateral hearing aid. **Conclusions:** 2 of 36 patients (6%) with presumed otosclerosis had findings on preoperative CT that changed management or counseling. Clinicians should consider obtaining routine preoperative CT before stapedectomy, although larger studies are needed to better quantify the cost and risk benefit tradeoffs.

199. In-Office Paper Patch Placement in Tympanic Membrane Perforation
 Negaar Aryan, MD, Orange, CA; Elaine C. Martin, MD, Orange, CA;
 Khodayar Goshtasbi, MS MD, Orange, CA; Mehdi Abouzari, MD PhD,
 Orange, CA; Hamid R. Djalilian, MD, Orange, CA

Educational Objective: At the conclusion of this presentation, the participants will have an understanding of the advantages of paper patch placement in treating tympanic membrane perforation and avoidance of surgery for a fairly large percentage of patients.

Objectives: To evaluate the healing of tympanic membrane (TM) perforation after paper patch placement. **Study Design:** A retrospective cohort. **Methods:** One hundred and eighty-nine patients with TM perforation between 2016-2022, with a mean age of 60 +/- 20 years were included. Patients with non-draining perforations less than 50% of the TM underwent paper patch placement after the edges of the perforation was treated with 50% trichloroacetic acid and freshening of edges with a hook. The patients followed up at 8 weeks. Our main outcome measure was the prevalence of healed or persistent TM perforations after the paper patching. **Results:** Among 189 patients who underwent paper patching, 81 (43%) had healed (healed TM group) and 108 (57%) had persisting TM perforations (non-healed TM group) at their eight week followup exams. The characteristics of perforations (size and location) and TMs (muscularization, granulation, atrophy, tympanosclerosis, and retraction) were not significantly different between the two groups. **Conclusions:** The results of this study demonstrate that a fairly large percentage of pa-

tients presenting with TM perforations can be treated with an office paper patch procedure and do not necessarily need an operative procedure. Paper patch should be considered for all patients with dry perforations less than 50% in size as a first step in potentially treating their perforation.

200. The Comparison between Revision Cochlear Implantation in Patients following Device Failure Versus Infection: A Single Institution Experience

Samuel R. Barber, MD, New Orleans, LA; Dori Viator, AuD, Baton Rouge, LA; Courtney Adams, AuD, Baton Rouge, LA; Rahul Mehta, MD, Baton Rouge, LA; Moises Arriaga, MD, Baton Rouge, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the indications for revision cochlear implantation and appreciate that outcomes vary in different clinical contexts.

Objectives: Revision cochlear implantation (CI) restores auditory rehabilitation with the goal of continued benefit from the replacement device. The most common indication for revision implantation is device failure. Less is known about outcomes for other indications, such as infections. Herein, we describe our experience at a large volume center comparing revision CI outcomes between device failure and infection. Study Design: IRB approved retrospective review at a single institution. Methods: Adult and pediatric subjects were identified who had prior cochlear implantation and underwent explantation and reimplantation for either infection or device failure. Datapoints comprised patient demographics, followup duration, and audiometric data. Results: Of subjects (5 adult and 12 pediatric), mean age for adults and children was 57 and 11 years, respectively. Overall, 47% were female, 41% were left sided, and 4/17 (24%) had infection. Mean followup post-activation was 58 and 34 months prior to device failure and infection, respectively. Mean followup revision post-activation was 33 and 12 months for failure and infection, respectively. Revision CI was performed simultaneously with explantation in failures while mean interval for revision in infections was 5 months. Mean changes in soundfield testing were $\Gamma\delta 7.6\text{dB} \pm 13.4$ (n=12) after failure and $10\text{dB} \pm 12.1$ (n=4) after infection. Mean changes in word recognition scores were $-3.5\% \pm 8.18$ (n=4) after failure and $\Gamma\delta 24\% \pm 20.9$ (n=3) after infection. Revisions following infection had shorter initial device usage and showed a trend of poorer testing performance. Conclusions: Revision CI is safe and efficacious for multiple indications. Initial data suggests worse outcomes following infection.

201. Utility of an Inexpensive 3D Printed Temporal Bone Model for Resident Education

Tyler Michael Bone, MD, Memphis, TN; Camron Davies, MD, Memphis, TN; Robert Yawn, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants will be able to identify current and future applications of low cost 3D printed temporal bone models for trainee education.

Objectives: To evaluate the educational utility of very low cost 3D printed models. Study Design: Pre-experimental post-survey. Methods: 3D slicer was used to segment the patient's right temporal bone and create a virtual model. Post-processing included coloring the tegmen, sigmoid sinus, semicircular canals, fallopian

canal, and chorda tympani with dyed epoxy. 5 models were printed, drilled, and evaluated on a 22 question survey using a 5 point Likert scale by 5 residents. Participants also commented on the models' general strengths and weaknesses. Results: Likert scale results reported as "mean (standard deviation)". Costs: 3D printer: \$480 (CR-200B), per unit: \$3.15. Model fidelity: bone hardness: 4.3 (0.57), drilling properties: 3.53 (0.99), overall physical: 3.8 (0.84), facial nerve anatomic similarity: 2.8 (1.23), boney structure anatomic similarity: 4 (0.83). Model utility: as a resident training tool: 4 (1.12), as a tool for surgical simulation: 3.6 (1.17). Conclusions: In this proof of concept study, we have produced an open source 3D temporal bone modeling pipeline that produces functional models using only a very low cost 3D printer. This model is well suited to supplement traditional cadaveric and patient based experiences by building junior trainees' surgical skills such as drill and irrigation handling, dust management, and basic anatomic navigation. In a 2022 meta-analysis, the average cost of 3D printers used for similar models was \$99,721. Given the much lower cost of this model, it is well suited for adoption by programs and trainees in low resource environments.

202. WITHDRAWN - Comparison of Stapedotomy Outcomes between Congenital Stapes Footplate Fixation and Otosclerosis

Robert M. Conway, DO, Madison Heights, MI; Jonathon S. Choi, MD, Farmington Hills, MI; Seilesh C. Babu, MD, Farmington Hills, MI

203. Facial Nerve Dehiscence and Otosclerosis: Our Outcomes with Stapedotomy

Robert M. Conway, DO, Madison Heights, MI; Jonathon S. Choi, MD, Farmington Hills, MI; Seilesh C. Babu, MD, Farmington Hills, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the safety and efficacy of stapedotomy for otosclerosis despite the presence of facial nerve dehiscence or prolapse.

Objectives: To evaluate the audiologic outcomes of stapedotomy in otosclerosis patients with the presence of a dehiscent or prolapsing facial nerve. **Study Design:** Retrospective chart review. **Methods:** Patients were separated into groups based on the presence or absence of facial nerve dehiscence or prolapse based on intraoperative findings. Audiologic outcomes and complications were compared between the two groups. **Results:** Five hundred and eighty-eight stapedotomy procedures were evaluated. There were 47 ears in the facial nerve dehiscence group and 541 ears in the bone covered group. Within the facial nerve dehiscence group, 63.8% of patients had only dehiscence while 36.2% had at least partial prolapse onto the oval window. Both groups had significant improvement in their pure tone average (PTA), mean bone conduction (BC) thresholds, and air bone gap (ABG) ($p < 0.05$). Mean BC thresholds were higher in the facial nerve dehiscence group both pre and postoperatively ($p < 0.05$). There were no other audiologic differences between the two groups. There were no audiologic differences when comparing those with only dehiscence of the facial nerve and those with prolapse onto the oval window. Successful closure of ABG to less than 10 dB was achieved in 73.8% of the bone covered group and 68.1% in the facial nerve dehiscence group. There were no patients with facial nerve paresis or paralysis after surgery. **Conclusions:** Stapedotomy is a safe and viable option for patients with facial nerve dehiscence or prolapse, with good audiologic outcomes and no episodes of facial paresis or paralysis postoperatively.

204. Medical Imaging as a Risk Factor for Rates of Vestibular Schwannoma (VS)

Victor de Cos, BS, San Diego, CA; Olivia Anne La Monte, BS, San Diego, CA; Timothy J. Sears, BS, San Diego, CA; Jeffrey Bernstein, MD, San Diego, CA; Marc Schwartz, MD PhD, San Diego, CA; Rick Friedman, MD PhD, San Diego, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the association between VS and prior history of radiation exposure through medical imaging.

Objectives: To investigate whether radiation exposure through imaging can increase the risk of vestibular schwannoma (VS). Study Design: Epidemiology cross-sectional study. Methods: Surveys were administered to Acoustic Neuroma Association members with VS spanning 2019-2021. Each patient was asked to identify an individual with similar lifetime exposures but no VS tumor. Patients were stratified by VS diagnosis, then by total lifetime number of MRI, CT, and X-ray exposures. A chi squared test was then performed to assess deviation from a normal distribution. Results: Among our preliminary data, 288 of the 329 patients (87.54%) surveyed had a VS diagnosis, with a mean age of 59, 80% female, and 91% white. In total 41 (13%) were identified as controls. Patients diagnosed with VS were more likely to have had 6 or more lifetime MRI scans than those without VS (30.72% vs. 4.76%; p value = 0.01) prediagnosis. Patients diagnosed with VS were more likely to have had 7 or more lifetime X-ray scans than those without VS (11.81% vs. 0.00%; p value = 0.02). Patients diagnosed with VS were more likely to have had a CT scan than those without VS (27.56% vs. 7.69%; p value = 0.12) though this was not significant with our preliminary, limited control data. Conclusions: Current literature on the association between radiation exposure and developing VS lends to controversy about whether a relationship exists. This self reported survey sheds light on this relationship with further investigation and evaluation required.

205. Multiple Forms of Stress May Be Associated with Audiometric Hearing Loss in a National Cohort

Michael W. Denham, MPhil, New York, NY; Justin S. Golub, MD MS, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to characterize the association between measures of stress (including total stress, familial/cultural conflict, and extrafamilial stress), and hearing loss (HL) among US Hispanic adults, as well as potential implications.

Objectives: To explore whether there is an association between stress and hearing loss (HL) among US Hispanic adults. Study Design: Cross-sectional multicentered epidemiological study (Hispanic community health study). Methods: We performed multivariable linear regression analysis to study the association between HL and various forms of stress. Stress was measured with a 17 question version of the Hispanic Stress Inventory. The inventory was additionally used to create 7 stress subscales (occupational/economic stress, parental stress, marital stress, immigration stress, familial/cultural conflict, extrafamilial stress, and intrafamilial stress). HL was measured by pure tone audiometry (4 frequency pure tone average in the better ear). Regressions analyzing the HL stress relationship were

adjusted for potential confounders, including age, sex, education, and birth location. Results: 4,372 subjects had complete data. The mean age was 46.4 years (SD=13.8 years). The mean hearing was 13.7 dB (SD=10.1 dB). On multivariable regression controlling for confounders, HL was associated with worse total stress ($\beta=0.046$; $p=0.041$), familial/cultural conflict ($\beta=0.0146$; $p=0.012$), and extrafamilial stress ($\beta=0.037$; $p=0.026$). Other measures did not exhibit significant associations with HL. Conclusions: Total stress, familial/cultural conflict, and extrafamilial stress were associated with worse hearing, controlling for potential confounders. These results evidence a need for further investigation of the relationship between HL and stress in marginalized populations. Furthermore, because stress may lead to depression, these findings support causality for the previously recognized relationship between HL and depression.

206. Delayed Presentation of Lung Cancer Metastasis to the Mastoid Bone: Case Report

Aatin Dhanda, BA, Newark, NJ; Christopher C. Tseng, MD, Hershey, PA; Yu Lan Mary Ying, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that a primary lung cancer can rarely metastasize to the mastoid bone.

Objectives: Metastasis to the mastoid bone is rare and has been described previously as a presenting symptom of a primary malignancy. We describe a case of metastasis to the mastoid bone presenting 2 years after a primary lung adenocarcinoma. Study Design: Case report. Methods: A 56 year old male with a history of smoking (15 pack years), and basal cell carcinoma of the leg, was found to have lung adenocarcinoma presenting as left vocal cord paresis 2 years prior to the current encounter, and completed chemoradiotherapy 1 year ago. He was additionally treated for brain and adrenal metastasis 1 year prior. He presented to otolaryngology with complaints of right sided otalgia, and CT scan demonstrated opacification of the right mastoid space. A diagnosis of mastoiditis was made. Mastoidectomy and excisional biopsy were performed, and pathology report revealed findings consistent with lung adenocarcinoma, with similar immunochemical markers to original primary lung malignancy. Concurrent chest imaging revealed no lung masses. Results: A literature review demonstrated that metastasis to the temporal bone are uncommon. One case of mastoiditis found to be a lung cancer metastasis (with primary lung cancer thought to be in remission) has been described, although breast cancer has been found in the mastoid up to 20 years later. This patient's history of metastasis to various secondary sites is also noteworthy. Conclusions: To our knowledge this is the first case which describes a sequence of delayed metastasis with a treated primary lung malignancy. Complaints of otalgia with even a distant history of lung malignancy should raise suspicion for metastasis.

207. WITHDRAWN - Otopalatodigital Syndrome: Use of Endaural Atresiaplasty and Management of Mixed Hearing Loss

Edward J. Doyle, MD, Cincinnati, OH; Johnathan Brown, MD, Cincinnati, OH; Ravi N. Samy, MD, Cincinnati, OH

208. Assessment of Agreement between Video Head Impulse Test and Rotary Chair in the Detection of Bilateral Vestibular Hypofunction

Hunter L. Elms, MD, Durham, NC; Kayla Kilpatrick, PhD, Durham, NC;

Maragatha Kuchibhatla, PhD, Durham, NC; Douglas B. Garrison, AuD, Durham, NC; Kristal M. Riska, AuD PhD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize that reduced bilateral video head impulse test gain corresponds most closely to rotary chair evidence of bilateral vestibular hypofunction.

Objectives: Determine if video head impulse test (vHIT) parameters agree with rotary chair (RC) testing in the detection of bilateral vestibular hypofunction (BVH). **Study Design:** Retrospective case control study of 66 patients (16 BVH, 50 non-BVH). **Methods:** Patients underwent same day vHIT, caloric, and RC testing by trained vestibular audiologists. Each patient was classified as either BVH or non-BVH for rotary chair using standard clinical interpretation. vHIT was classified as BVH or non-BVH based on gain values and/or presence of catch up saccades. Rotary chair was considered the gold standard for detection of BVH. McNemar's tests were used to explore agreement between vHIT classification and RC classification of BVH. **Results:** The use of bilateral vHIT gain reduction (less than 0.8) to classify patients' BVH status demonstrated agreement with the diagnosis of BVH on RC (McNemar $\chi^2= 0.8$, $p=0.371$). Only 5 out of 66 patients showed disagreement with this classification method between the two tests. The use of the presence of bilateral saccades alone on vHIT (irrespective of gain status) to classify BVH status significantly disagreed with RC classifications (McNemar $\chi^2= 17.391$, $p<0.0001$). The use of bilateral saccades overestimated the presence of BVH relative to RC. **Conclusions:** Agreement was observed in the detection of BVH when using vHIT gain of less than 0.80 with rotary chair. Among patients with reduced gain, there was agreement 92% of the time between the tests. In patients with bilateral catch up saccades and for whom gain is not reduced bilaterally, confirmation of BVH status with rotary chair is recommended given the misclassifications observed in this study.

209. **Computational Fluid Dynamics Model of Pulse Synchronous Tinnitus in a Patient with Sigmoid Sinus Dehiscence**

Ariel Finberg, MD, Charlottesville, VA; Adithya Reddy, BSE, Charlottesville, VA (Presenter); Haibo Dong, PhD, Charlottesville, VA; Bradley Kesser, MD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify differences in fluid flow between the asymptomatic and symptomatic side of a patient with pulse synchronous tinnitus (PST).

Objectives: PST has been linked to multiple anatomical variants of the central nervous system venous outflow tract (CVOT) including transverse sinus (TS) stenosis and sigmoid sinus (SS) dehiscence. This study investigates if turbulent flow, pressure, shear stress along the CVOT, and the inherent anatomy are contributing mechanisms that result in PST and SS dehiscence. **Study Design:** Computational study using Reynold averaged Navier-Stokes (RANS) modeling in a subject with unilateral PST. **Methods:** CVOT models were reconstructed from computed tomography (CT) scans of one patient with unilateral PST. Two CVOT models of the patient are obtained, on the symptomatic and contralateral asymptomatic side. A turbulent model enabled commercial RANS flow solver is used to simulate the pulsatile blood flow of blood through the vessels. Eight cross-sections of each model surrounding the TS and SS junction were analyzed to observe the velocity, pressure, and vorticity distributions. Pressure, velocity, turbulent kinetic energy

(TKE), and shear stress changes were analyzed over a simulated cardiac cycle. Results: Flow in the symptomatic side showed increased velocity prior to SS and increased vorticity and decreased pressure distal to the SS. Increased spikes of TKE were observed on the symptomatic side associated with each cardiac cycle, while TKE on the asymptomatic side remained near zero. TKE and shear stress were higher on the symptomatic side and have periodicity coinciding with pulsatile flow. Conclusions: Computational fluid dynamics modeling of blood flow through the CVOT in PST suggest that these differences in flow may alter the anatomy and result in PST.

210. Analyzing the Relationship Between Audiometric Hearing Loss and Dementia Using a Large Electronic Health Record System

Maehar R. Grewal, BS, New York, NY; James M. Noble, MD MS, New York, NY; Justin S. Golub, MD MS, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the association between hearing loss (HL) and dementia as well as the pros and cons of utilizing an electronic health record system as the dataset.

Objectives: Hearing loss (HL) has previously been associated with dementia in numerous population level epidemiologic studies. We aim to explore whether this association holds when using a large electronic health records system containing digitally stored audiograms. Study Design: Cross-sectional retrospective epidemiologic study. Methods: Data were collected from a large electronic health record with structured, digitized audiograms. Included subjects were age 18 and older who underwent audiometry between February 1, 2020, through December 15, 2021. HL was measured with the 4 frequency pure tone average in the better ear. Dementia was defined in two ways: by ICD-10 diagnosis code (G30.X-G32.X), or by presence of FDA approved dementia medications on the medication list. Multivariable logistic regression controlling for age and cardiovascular risk was conducted to analyze the association between HL and dementia. Results: A total of 7,591 subjects had audiograms. The mean age was 60.5 years (SD=18.4 years) and mean HL was 29.5 decibels (dB) (SD=18.6 dB). 192 subjects had dementia defined by ICD-10 code and 193 by medication. No association was found between HL and dementia defined by ICD-10 code, when controlling for age and cardiovascular risk. When defining dementia by medication use, controlling for age and cardiovascular risk, the odds of dementia increased by 13% for every 10 dB worsening of HL ($p=0.005$). Conclusions: Greater HL was associated with dementia when dementia was defined by medication use, but not by ICD-10 code. This illustrates limitations of using coded billing data, such as ICD-10, when performing epidemiologic studies with electronic health record systems.

211. Exploring the Association between Schizophrenia/Serious Mental Illness and Hearing Loss in a Large Scale Electronic Health Record

Maehar R. Grewal, BS, New York, NY; Alice Saperstein, PhD, New York, NY; Thomas S. Stroup, MD MPH, New York, NY; Alice A. Medali, PhD, New York, NY; Justin S. Golub, MD MS, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to identify a relationship between hearing loss (HL) and serious mental illness (SMI), including schizophrenia, using different definitions of the latter.

Objectives: To explore whether schizophrenia/serious mental illness (SMI) may be associated with hearing loss (HL) using a large electronic health records system with digitized audiograms. **Study Design:** Retrospective cross-sectional epidemiologic study. **Methods:** Data were extracted from a large electronic health record system containing digitally stored audiograms. Subjects were 18 years old or greater who had an audiogram between February 1, 2020, and December 15, 2021. HL was measured by pure tone average. Schizophrenia was defined by ICD-10 diagnosis code (F20.X). Serious mental illness was defined by presence of medications from a specified set. Multivariable regressions controlling for demographics and cardiovascular risk were conducted to analyze the association between HL and both schizophrenia and SMI. **Results:** 7,591 unique subjects had audiometric data. Average age was 60.5 years (SD=18.4 years) and average hearing was 29.5 decibels (dB) (SD=18.6 dB). Seven subjects had schizophrenia defined by ICD-10 code and 168 had serious mental illness defined by their medication list. No association was found between HL and schizophrenia defined by ICD-10 code, when controlling for age and cardiovascular risk. The odds of serious mental illness increased by 1.13 for every 10 dB worsening of HL ($p=0.004$), controlling for age and cardiovascular risk. **Conclusions:** An association was found between HL and serious mental illness defined by the medication list but not between HL and schizophrenia defined by ICD-10 code. Understanding the relationship between HL and SMI is important for patient care. This study illustrates the advantages and constraints of performing epidemiologic studies using large electronic health records.

212. **An In Vitro Model of Cisplatin induced Schwann Cell Toxicity in the RSC96 Cell Line**

Katherine Kedeshian, BS, Los Angeles, CA; Michelle Hong, BS, Los Angeles, CA; Larry Hoffman, PhD, Los Angeles, CA; Ashley Kita, MD, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to investigate Schwann cell injury and potential demyelination as a mechanism of cisplatin ototoxicity and to advance a method of screening therapeutic targets for Schwann cell rehabilitation.

Objectives: Cisplatin is known to cause inner ear dysfunction. There is growing evidence that cisplatin induced demyelination of spiral or Scarpa's ganglion neurons may play an additional role in drug induced ototoxicity alongside afferent neuron injury. Through using Schwann cell viability as a proxy of remyelination, there may be an opportunity to reduce ototoxic inner ear damage. This work describes a model for reducing cisplatin induced injury by promoting Schwann cell viability. **Study Design:** Using a rat Schwann cell line, RSC96, a cisplatin dose curve was produced to identify the lethal concentration of 50% of the cells (LC50). The antioxidant N-acetyl cysteine (NAC) was then co-dosed at varying concentrations with cisplatin. **Methods:** RSC96 cells were seeded at a density of 4,000 cells/well in 96 well plates 24 hours prior to co-treatment with cisplatin and NAC. Cell viability was assessed 48 hours after treatment using the CCK8 assay. **Results:** The LC50 dose of cisplatin was determined to be 3.34 μM ($p=2.2\text{E-}16$) using a four parameter logistic regression. NAC demonstrated a protective effect when compared to the conditions dosed exclusively with cisplatin on one way ANOVA analysis ($p=3.1\text{E-}15$). When co-dosed with cisplatin NAC concentrations of 100 μM and 1000 μM showed increased viability compared to cisplatin alone. Con-

clusions: Schwann cell injury following cisplatin insult is described in this in vitro model which allows for screening of potentially therapeutic agents. Cisplatin was found to cause injury at physiologic concentrations and NAC was found to improve cell viability and mitigate this injury, thus demonstrating promise as a therapeutic agent to offset cisplatin induced ototoxicity.

213. The Relationship between Meteorological Factors and Google Searches for Cochlear and Vestibular Symptoms

Joshua K. Kim, BS, Durham, NC; Karen Tawk, MD, Orange, CA; Navid Mostaghni, BS, Orange, CA; Khodayar Goshtasbi, MS MD, Orange, CA; Hamid R. Djalilian, MD, Orange, CA; Mehdi Abouzari, MD PhD, Orange, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the relationship between climate and Google searches for cochlear and vestibular symptoms.

Objectives: To explore correlations between a state's climate temperature, wind speed, and precipitation with Google searches for otological symptoms. Study Design: Retrospective database analysis. Methods: Google Trends was queried with 13 common cochlear and vestibular symptoms, including "tinnitus", "vertigo", and "headache". Web search results for terms between 2018 and 2021 were reported by state. Average precipitation, temperature, and wind speed measures were obtained from the U.S. National Oceanic and Atmospheric Administration. Two tailed Spearman's rank correlation rho was used to find associations between symptoms and climate parameters. R version 4.2.0 was used for analysis with $p < 0.05$ deemed significant. Results: Eight terms correlated to precipitation, with the largest effects observed in positive correlations to neck pain ($p < 0.001$), headache ($p < 0.001$), sinus pressure ($p < 0.001$), and otalgia ($p < 0.001$). Temperature positively correlated to 11 terms, including headache ($p < 0.001$), sinus pressure ($p < 0.001$), neck pain ($p < 0.001$), and otalgia ($p < 0.001$), and negatively with tinnitus ($p < 0.001$), hearing loss ($p = 0.01$), and migraine ($p = 0.02$). Peak gust wind speed correlated positively to otalgia ($p < 0.001$), phonophobia ($p = 0.02$), and photophobia ($p = 0.02$), and negatively to neck pain ($p = 0.01$). Highest instantaneous wind speed positively trended with sudden hearing loss ($p < 0.001$), headache ($p = 0.01$), and phonophobia ($p = 0.03$), and negatively with dizziness ($p = 0.01$). Conclusions: Meteorological factors displayed moderate to strong correlations with Google search interest for cochlear and vestibular symptoms. Barometric sensors of the inner ear may contribute to meteoropathy symptoms in humans including migraine related otological features.

214. Quality and Readability of Hearing Aid Related Websites in English and Spanish

Brian P. Kinealy, MD, Lexington, KY; Abbigayle J. Willgruber, BS, Bowling Green, KY; Marissa R. Schuh, MPH, Lexington, KY; Matthew L. Bush, MD PhD MBA, Lexington, KY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe current recommendations regarding quality and readability of online health materials and to describe current availability of resources regarding hearing aid information using these criteria.

Objectives: To determine the readability and quality of online hearing aid information in English and Spanish. **Study Design:** Cross-sectional. **Methods:** Four different search engines were used to analyze the top 75 websites that resulted from a search for “hearing aid”. Websites that met the inclusion criteria were assessed for quality and readability. Article readability was quantified using the Flesch Reading Ease Score (FRES) and the Fernandez-Huerta Formula (FHF) in English and Spanish, respectively. Each website was independently reviewed by experts using the DISCERN criteria for the quality of online health information. Results were analyzed using the student’s t test and the Mann-Whitney U test. **Results:** The average FRES for English websites was 55.37 (SD=7.73), with a minimum score of 39.9, and a maximum score of 73.9. The average FHF score for Spanish websites was 58.64 (SD=5.26), with a minimum score of 49.03, and a maximum score of 67.67. There was a wide variability in quality scores using the DISCERN instrument for both English (mean=32.16, SD=10.60) and Spanish (mean=38, SD=9.7). **Conclusions:** This study shows that both English and Spanish websites are written at a level that is much higher than the AMA recommended sixth grade reading level for healthcare resources, corresponding to a FRES and FHF score of 80 or above. These results indicate that the most widely available online resources might not be readily understandable. Furthermore, these resources lacked consistent quality that might help patients make informed decisions about their hearing healthcare. This study highlights the importance of providing informative, accurate and readable materials to patients who are increasingly turning towards online resources for healthcare information.

215. Impact of the COVID-19 Pandemic on Followup Adherence after Ossicular Chain Reconstruction at a Tertiary Care Center

Jasmine Leahy, BS, New York, NY; Kevin Wong, MD, New York, NY; Bashar Zaidat, BA, New York, NY; Sunder Gidumal, MD, New York, NY; Ann Powers, MD, New York, NY; Maura K. Cosetti, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe how the COVID-19 pandemic affected adherence to followup appointments in patients who underwent ossicular chain reconstruction (OCR) surgery; and 2) identify opportunities for improvement in patient compliance for otologic surgery.

Objectives: The aim of this study was to examine the impact of the COVID-19 pandemic on patient followup compliance after ossicular chain reconstruction (OCR). **Study Design:** Retrospective cohort comparison of patients who underwent OCR surgery prior to and following the pandemic. The pre-pandemic period was defined as date of surgery (DOS) between February 15, 2017, and December 31, 2018; the pandemic period was defined as DOS between February 15, 2020, and December 31, 2021. Demographics, surgery, and adherence to short (less than 1 month) and long term (greater than 1 month) postoperative appointments were recorded. **Methods:** Continuous variables were compared using two tailed t tests and parametric data were compared using Mann-Whitney U tests ($\alpha=0.05$). Linear regressions were performed to determine if demographic factors predicted follow-up compliance. **Results:** 148 subjects were included, 72 in the pre-pandemic and 76 in the pandemic cohort. Average age was 44.2 years; 71 subjects were female and 78 were male. Prior to the pandemic, 12 out of 72 patients (16.7%) missed short term followup and 5 out of 72 (6.9%) missed long term followup. During the pandemic, 12 out of 76 patients (15.8%) missed short term followup and 9 out of 76 (11.8%) missed long term followup. DOS and demographic factors, including age,

ethnicity, gender, and primary language did not correlate with compliance. Conclusions: The pandemic did not dramatically impact surgical volume or no show rates following OCR. This suggest that after initial changes, both patients and health systems alike may adapt and function at pre-pandemic levels. Potential explanations include prioritizing of surgical followups or increase in telemedicine, which may be explored further.

216. Determining the Pathogenic Potential of Turicella Otitidis and Staphylococcus Auricularis in Adult Populations

Madeline M. Marker, BA, Minneapolis, MN; Janet S. Choi, MD MPH, Minneapolis, MN; Tina C. Huang, MD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the potential pathogenicity of turicella otitidis and staphylococcus auricularis in the ear along with associated factors, management and outcomes.

Objectives: Turicella otitidis and staphylococcus auricularis are considered normal aural flora and their significance in active ear infections has been controversial. We examined a series of patients with acute and chronic otitis media whose ear canal culture isolated T. otitidis and S. auricularis and explored their possible pathogenicity, factors associated with infection and outcomes. Study Design: Retrospective chart review. Methods: Patients who presented to a tertiary center outpatient clinic between 2017 and 2022 with otologic microscopic exam of active infection and whose ear canal culture isolated T. otitidis or S. auricularis without other known pathogenic organisms. Results: Total of 13 patients (10 with T. otitidis and 3 with S. auricularis) were included (mean age 38 +/- 18 years, 62% female). All patients had a history of prior otologic surgery (92%) and/or tympanic membrane perforation (62%). All patients were treated with antibiotic otic drops (100%) +/- oral antibiotics (15%). After treatment, otitis media completely resolved among 10 patients while drainage and mucosalization of the TM returned or continued among 3 patients. Sensitivity results demonstrated a majority of T. otitidis was resistant to clindamycin and there was no resistance found for S. auricularis among the tested antibiotics. Conclusions: Our findings suggest the potential pathogenicity of T. otitidis and S. auricularis especially among patients with a history of prior ear surgery or tympanic membrane perforation. Violation of the normal canal skin barrier from the surgery or trauma may contribute to the pathogenicity. Future study is warranted to elucidate pathogenicity of normal aural flora and its mechanisms.

217. Disparities in Hearing Loss Prevalence in Adults: How Race and Ethnicity, Education Level, and Socioeconomic Status Impact Hearing Impairment in the United States

Monica O'Brien, MS, Boston, MA; Kathryn Noonan, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss how social determinants of health impact hearing loss prevalence within certain groups and describe how an individual's race and ethnicity, education level, and socioeconomic status impacts their odds of having hearing loss.

Objectives: There is limited information on the impact of social determinants of health on hearing loss (HL). The main aim of this paper is to compare the prevalence of hearing loss by social determinants of health. Study Design: Cross-sec-

tional study. Methods: The National Health and Nutrition Examination Survey (NHANES) data from 2015 to 2020 were analyzed controlling for sex and age, to compare hearing impairment by income, ethnicity, education level, and access to healthcare. HL was defined by a four frequency pure tone average > 25 decibels in one or both ears. Results: 6048 participants were included. The overall prevalence of HL was 18.3%. Lower annual household income (\$5,000-\$9,999) had the highest odds of HL with 3.124 times the odds compared to the \$100,000 and over group. Less than 9th grade, some high school, and high school graduate/graduate equivalency degree (GED) education levels had 1.996, 2.015, and 1.419 times the odds of HL respectively compared to college graduates or above. Hearing loss was fairly consistent between ethnic groups however when compared to non-Hispanic White participants, non-Hispanic Black participants had 0.621 times the odds of HL. Conclusions: Social determinants of health impact the odds of having HL. Non-Hispanic White participants had significantly higher odds of HL than non-Hispanic Black participants. Participants who did not start college had higher odds of hearing loss than those who started or finished college. Lower socioeconomic status tends to have higher odds of HL households making over \$100,000 annually.

218. Osseointegrated Hearing Implant Devices and Their Adverse Events: How the OSIA Implant Compares to BAHA

Tyler J. Ostrowski, BS, Albany, NY; Rafael Cardona-Rodriguez, MD, Albany, NY; Hemali Shah, BA BS, Albany, NY; Nathan Tu, MD, Albany, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate understanding of the most commonly reported adverse events associated with OSIA devices and how these events differ from those associated with BAHAs.

Objectives: Implantable OSIA devices show promise to minimize disadvantages associated with BAHAs, particularly related to issues with osseointegration and patients' skin. This study queried the FDA medical devices reporting data to identify commonly reported adverse events associated with the relatively new-to-market OSIA implant. Study Design: Retrospective database review. Methods: Data from the FDA's Manufacturer and User Facility Device Experience (MAUDE) database was queried using for OSIA and BAHA associated adverse events from August 2019-January 2022 and June 2021-January 2022, respectively. Data collected included patient injury, type of injury, device malfunction, and associated interventions. Descriptive statistics were used to analyze data. Results: For BAHA devices (N=467), 440 adverse events were reported with 386 associated interventions. For OSIA (N=167), 167 injuries were reported with 149 interventions. BAHA injuries most commonly involved skin infections (N=230(52.0%)). The most common interventions in the BAHA cohort were replacement/removal of abutment (N=178(46.1%)) and antibiotics (N=146(37.8%)). Common OSIA injuries included surgical site infections (N=69(43.1%)) and device extrusion (N=39(24.4%)) with the most common interventions being explantation (N=69(46.3%)) and antibiotics (N=67(45.0%)). Conclusions: The MAUDE database provides preliminary information on the comparative prevalence of soft tissue infections associated with OSIA implants and BAHAs. Initial OSIA reporting demonstrates surgical site infections and explantation are most commonly reported adverse events and interventions, respectively. The OSIA implant is subject to a period of adjustment and development throughout its market implementation regarding implantation and management techniques.

219. Heschl's Gyrus Multi-Atlas for MRICloud

Carlos Antonio Perez-Heydrich, BS, Baltimore, MD; Dominic Padova, MS, Baltimore, MD; Kwame Kutten, PhD, Baltimore, MD; Tilak Ratnanather, PhD, Baltimore, MD; Andreia Faria, MD PhD, Baltimore, MD; Yuri Agrawal, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should know about a new cloud based method to automatically segment Heschl's gyrus.

Objectives: To create a multi-atlas to map Heschl's gyrus (HG) and its associated primary auditory cortex using MRICloud, a cloud based, automatic segmentation program. **Study Design:** Methodologic development. **Methods:** MRICloud is an online platform which includes tools to automatically segment structural MRIs into 287 labeled brain regions. One of its current labeled atlas sets (multi-atlas) consists of 31 subjects from 50 to 90 years old with different HG anatomies. This atlas set was manually resegmented according to a simplified protocol in an orthogonal view to separate each superior temporal gyrus (STG) into three subunits: the anterior STG, Heschl's gyrus, and posterior STG. The modified atlas set with additional manually labeled HGs acts as a new, 291 label multi-atlas set and was uploaded to MRICloud. This new method of automated segmentation of HG will then be compared to the gold standard, manual segmentation of HG in MRIs of 10 subjects with age related hearing loss by analyzing the Dice overlap coefficient after segmentation. **Results:** Thirty-one 50-90 year old adult brain MRIs were manually segmented creating 3 new, contiguous labels: HG, anterior STG, and posterior STG. Heschl's gyrus was the anatomical divider between the anterior and posterior STGs as it extends anterior-laterally from posterior to the insula. This multi-atlas set was uploaded to MRICloud for public use. **Conclusions:** This multi-atlas alleviates the manual segmentation effort and the difficulty in choosing an HG anatomical definition. This protocol is limited by its detail, which may overcorrect true biological variability instead of eliminating artifacts. Future work will apply this multi-atlas to a study of age related hearing loss.

220. Management of Fallopian Canal Spontaneous Cerebrospinal Fluid Leaks

Abdul Kadir Saltagi, BS, Indianapolis, IN; Mohamad Z. Saltagi, MD, Indianapolis, IN; Rick F. Nelson, MD PhD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the presentation of lateral skull base CSF leaks and describe the approach to repairing a leak within the fallopian canal of the facial nerve.

Objectives: Describe the diagnosis and management of a spontaneous cerebrospinal fluid (CSF) leak through the facial nerve fallopian canal. **Study Design:** Retrospective case review. **Methods:** After obtaining institutional review board approval, the medical record database was used to review the patient's history, radiographic characteristics, intraoperative approach and findings, hospital course, and long-term outcomes. **Results:** 50 year old female presented with bilateral conductive hearing loss, severe headaches, and left greater than right otorrhea. CT imaging revealed bilateral tegmen defects and temporal encephaloceles. During middle cranial fossa (MCF) repair of the left encephalocele, CSF was observed pulsing from the temporal bone/middle ear. Drilling the labyrinthine segment of

the facial nerve revealed a CSF leak from the fallopian canal. A non-occlusive temporalis muscle plug was placed in the fallopian canal and tegmen repair was competed with bone cement. Postoperative facial nerve function was normal, yet a postoperative CSF leak was observed and managed with a lumbar drain which revealed elevated ICP. A ventriculoperitoneal shunt was placed and the CSF leak resolved. One month later, she exhibited improved conductive hearing on audiometric testing, resolution of middle ear fluid on CT imaging, and complete resolution of headaches. No progression of the right encephalocele has been observed at 2 years. Conclusions: Fallopian canal meningocele is a very rare finding in patients presenting with spontaneous CSF leak and is highly associated with idiopathic intracranial hypertension. CSF diversion is recommended in combination with skull base repair with the MCF approach to preserve facial nerve function and conductive hearing.

221. Bilateral Cochlear Implantation Improves Speech Perception Scores in Adult Patients, Including Those Aged 65 Years or Older

Sarek A. Shen, MD MS, Baltimore, MD; Nicholas S. Andresen, MD, Baltimore, MD; Stephen B. Bowditch, AuD MS, Baltimore, MD; Charles C. Della Santina, MD PhD, Baltimore, MD; Daniel Q. Sun, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the benefit of sequential, second sided cochlear implants, and variables that may contribute to differences in improvement.

Objectives: Examine the effectiveness of second sided cochlear implants (CI) in adults as measured by change in speech perception scores. Identify patient and CI characteristics associated with degree of improvement. Study Design: Retrospective cohort study. Methods: Arizona Biomedical (AzBio) Sentence Test, Consonant-Nucleus-Consonant word (CNC-W), and Hearing in Noise Test (HINT) scores were collected for adults who received bilateral, sequential cochlear implants between 1985 and 2019. First and second sided postoperative speech perception scores under best aided conditions were compared. The association between change in score and clinical variables were evaluated. Results: 141 individuals were included in this study. The median age at first sided implant was 49.4 years (range, 21.3-83.3); median age at second sided implant was 51.2 years (range, 24.4, 89.7). 60 patients with AzBIO scores, 70 patients with HINT scores, and 95 patients with CNC-W scores, demonstrated mean improvements of 12.0 (SD: 25.3), 8.4 (SD: 26.3), and 11.5 (SD: 18.6) points, respectively. There was no difference in improvement between patients aged 65 and older, and younger patients (t-tests: AzBIO: 95% CI [-16.7, 17.4]; HINT: 95% CI [-34.6,0.5]; CNC-W: 95% CI [-10.7,13.1]), regardless of test modality. There was a slight negative relationship between CNC-W score changes and time interval between first and second implant ($b = -0.02$, 95% CI [-0.03, -0.001]). No association between score changes and second CI electrode array type (lateral wall, mid-scala, or perimodiolar) was observed (one way ANOVA $F = 1.3$; $p=0.27$). Conclusions: Intervention with a second sided cochlear implant was associated with improved speech recognition scores under best aided conditions in adult patients. This benefit extended to patients aged 65 and over. The magnitude of improvement in CNC-W scores decreased slightly with increased interval between first and second sided CI.

222. Lead Poisoning: A Compelling Reason for Beethoven's Deafness

Michael Henry Stevens, MD, Salt Lake City, UT; ,

Educational Objective: At the conclusion of this presentation, the participants should be able to reaffirm that Beethoven's hearing loss was due to chronic consumption of wine tainted with lead.

Objectives: Significant articles written since the publication of the article *Lead and the Deafness of Ludwig Van Beethoven* in the 2013 November Issue of *The Laryngoscope* support, but others challenge its thesis of the cause of Beethoven's deafness. A review of these articles was done to reaffirm that his hearing loss was due to chronic consumption of wine tainted with lead. **Study Design:** Review of relevant articles for comment and clarification. **Methods:** Article review. **Results:** An article written in 2017 suggested that the excess thickness of Beethoven's skull could be caused by Paget's disease. Pyelonephritis seen at his autopsy with secondary hyperparathyroidism can also cause bone thickening. Multiple other features indicate that this diagnosis is a very unlikely cause of his deafness. In 2022 congenital syphilis was selected as the cause of his deafness, because his father was an alcoholic. There is no evidence, however, that his father or mother ever had syphilis, and Beethoven lacked other findings commonly seen with congenital syphilis. A fascinating article published in the 2021 January issue of *The Laryngoscope* reported a woman with high levels of lead in her blood and audiometric findings consistent with Beethoven's description of his hearing loss. Other symptoms, however, confirm that she had subacute or classic lead poisoning with normal auditory brain stem responses (ABR). In contrast, a review of hearing loss due to chronic lead exposure in 2016 demonstrated uniformly abnormal ABR. This site of injury corresponds with the shrunken cochlear nerves seen at Beethoven's autopsy caused by axonal degeneration from lead. **Conclusions:** The most compelling reason for Beethoven's deafness is lead poisoning.

223. Association between Hearing Loss and Electronic Cigarette Use: A Population Based Analysis

Alexander J. Dwyer, PhD, Minneapolis, MN; Griffin Struyk, BS, Minneapolis, MN; Meredith E. Adams, MD MS, Minneapolis, MN; Tina C. Huang, MD, Minneapolis, MN; Janet S. Choi, MD MPH, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the potential relationship between electronic cigarette use and hearing loss.

Objectives: Previous studies have demonstrated the relationship between smoking and hearing loss (HL). In recent years, e-cigarettes have become increasingly popular, but little is known about their association with hearing. **Study Design:** Cross-sectional study. **Methods:** Data from the 2015-2016 National Health and Nutritional Examination Survey were analyzed. Adults aged 20-69 years completed an audiometric evaluation and questionnaire on e-cigarette use (n=4,305). HL was defined as speech frequency pure tone average (PTA) in the better hearing ear. E-cigarette use was defined as ever and recent use (in the past month). Serum cotinine, a primary metabolite of nicotine, was measured. Multivariable regression analyses were performed. **Results:** The prevalence of ever e-cigarette use was 22.4% [95% CI: 20.3-24.7%] and was associated with younger age (OR: 0.96, [95% CI: 0.96-0.97]). After age adjustment, ever e-cigarette use was associated with higher PTA (β : 1.54, [95% CI: 0.95-2.14]). In a multivariable model adjusting for demographics, comorbidities, traditional smoking, and noise exposure, ever e-cigarette use was associated with higher PTA (β :0.82, [95% CI: 0.01-1.63]).

There was no significant dose response relationship between HL and more days per month of e-cigarette use. More frequent e-cigarette use was associated with increased serum cotinine, but serum cotinine was not associated with PTA (β : 0.001, [95% CI: -0.002-0.004]). Conclusions: There was a significant association between ever e-cigarette use and HL. However, when using serum cotinine level as an objective measure of e-cigarette use, there was no association with HL. There may be other factors such as additional noise exposure or behavior accounting for the association. Future longitudinal studies are needed to evaluate this relationship.

224. Evaluation of 3D Printed Temporal Bone Models in Surgical Simulation

Kaitlyn Tholen, BS, Shreveport, LA; Gauri Mankekar, MD PhD, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the value of 3D printed temporal bones in surgical simulation and compare the quality of different 3D printing materials in simulation.

Objectives: To evaluate the utility of three dimensional (3D) printed temporal bones in surgical training and determine which 3D printing material is comparable to cadaveric bone. Study Design: Prospective study. Methods: Eight temporal bone models were 3D printed from patients' computed tomography (CT) scans with four different materials [acrylonitrile butadiene styrene plastic filament (ABS), polylactic acid filament (PLA), high impact polystyrene (HIPS), and Formlabs white resin (Resin)]. Eight otolaryngology residents performed a simple mastoidectomy on the models and completed an eight item Likert scale questionnaire comparing the models to cadaveric bones. Results: The average rating for the overall value of the 3D printed bones was 2.94 +/- 1.24. The models were rated as "very similar" to cadaver bones for their ease of use (4.31 +/- 1.16) and their safety (4.19 +/- 1.13) in the lab. The bones were rated as "similar" to cadaver bone for its value in surgical training (3.25 +/- 1.13); however, they were rated less "similar" when compared to experience in the operating room (2.93 +/- 1.02). The bones were rated poorly for their bony anatomy (2.63 +/- 1.03). Resin had significantly higher average ratings overall compared to HIPS ($p=0.03$) and PLA ($p=0.003$), but not compared to ABS ($p=0.41$). Conclusions: The 3D printed temporal bones were safe and easy to use in surgical simulation like cadaver bones; however, the models were rated poorly for their bony anatomy and overall value. Our future studies will aim to improve the anatomy of the models and the materials used to better represent the temporal bone drilling experience.

225. Machine Learning Analysis of Population Level Physical Activity Data to Classify Vestibular Dysfunction

Erik B. Vanstrum, MD, Los Angeles, CA; Janet Choi, MD, Minneapolis, MN; Yael Bensoussan, MD MSc FRCSC, Tampa, FL; Alaina Bassett, AuD PhD CCC-A, Los Angeles, CA; Matthew Gordon Crowson, MD, Boston, MA; Peter A. Chiarelli, MD DPhil, Los Angeles, CA

Educational Objective: At the conclusion of this presentation, the participants will be introduced to the concept of evaluating the vestibular system by utilizing sensor technology and machine learning (ML).

Objectives: To evaluate whether machine learning (ML) analysis of physical activity data can be employed to classify whether individuals have vestibular dysfunction. **Study Design:** Retrospective cohort. **Methods:** A one week period of physical activity data was measured by waist worn uni-axial accelerometer during the 2003-2004 National Health and Nutrition Examination Survey sampling period. Features of physical activity along with basic demographic information were paired with ML models to predict the success or failure of a standard 30 second modified Romberg test during which participants had eyes closed and stood upon a 3 inch compliant surface. Model performance was evaluated by area under the receiver operating characteristic curve (AUC-ROC), balanced accuracy, and Dice similarity coefficient (F1-score). **Results:** The cohort was comprised of 1625 participants and approximately half (47%) were classified with having vestibular dysfunction having failed the binarized (pass/fail) scoring mechanism of the modified Romberg exam. Five ML models were trained on the classification task, achieving AUC values ranging from 0.67 - 0.73. The support vector machine (SVM) and a gradient boosted model XGBoost achieved the highest AUC of 0.73 (SD 0.71-0.75). Age was the most important variable for SVM classification, followed by four features which evaluated accelerometer counts at various thresholds, including those delineating total, moderate, and moderate-vigorous activity. **Conclusions:** ML analysis of accelerometer derived physical activity data to classify vestibular dysfunction is feasible and efficacious in real world environments such as the home.

226. Rare Temporal Bone Metastasis from Neuroendocrine Carcinoma of Bladder: Case Report

Stephanie Yizhu Wang, BS, Philadelphia, PA; Neel Sangal, MD, Philadelphia, PA; Alexandra Quimby, MD, Philadelphia, PA; Jane Lee, MD, Philadelphia, PA; Jason Brant, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be aware of a unique possible presentation of neuroendocrine tumor.

Objectives: Metastasis to the temporal bone is an extremely rare entity. Previous literature has described primary neuroendocrine carcinoma of the bladder (NCB) metastasizing to the liver, brain, and adrenal glands. No cases have been reported of it metastasizing to the temporal bone. We present this rare clinical case and its management. **Study Design:** Case report. **Methods:** The authors participated in care for the patient and retrospectively reviewed provider impressions, radiologic imaging, and pathology slides. **Results:** A 79 year old male recently diagnosed with NCB presented to the emergency department with left ear discomfort and left sided facial paralysis of two week duration and outside hospital CT with concern for otomastoiditis. Exam was significant for obstructive edema of the left ear canal and tenderness to palpation over the mastoid region. Repeat CT temporal bone was consistent otomastoiditis and skull base osteomyelitis. He was started with broad spectrum antibiotics pending further imaging. STAT MRI was significant for a destructive mass centered in the left mastoid skull base, hyperintense on T1 and hypointense on T2. The patient was taken to the operating room for mastoidectomy, facial nerve decompression, and lateral skull base biopsy. Biopsy was significant for metastatic small cell neuroendocrine carcinoma. The patient underwent testing and planning for systemic chemotherapy with medical oncology and was discharged home. **Conclusions:** Although otomastoiditis is an extremely common clinical entity, we must have a degree of suspicion for atypical parallel presentations. We report the only case of metastatic neuroendocrine bladder carcinoma to the temporal bone.

227. Bifid Intratemporal Facial Nerves in an Adult without Associated Middle or Inner ear Abnormalities

Stephen F. White, MD, Memphis, TN; Natasha D. Tillett, BS, Memphis, TN; Monica T. Ogunsusi, BS, Memphis, TN; Robert J. Yawn, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize that abnormalities of the intratemporal facial nerve may rarely occur in individuals without other associated middle or inner ear anomalies and may impact the approach to safe cochlear implantation surgery.

Objectives: To describe a case of bifid intratemporal facial nerves without associated middle or inner ear abnormalities encountered on computed tomography (CT) imaging during preoperative preparation for unilateral cochlear implant placement in an adult male with profound sensorineural hearing loss. **Study Design:** Case report. **Methods:** A rare case of bilateral bifid intratemporal facial nerves in an adult male is presented. The finding's impact on approach to safe cochlear implantation is discussed. **Results:** Bifurcation of the intratemporal facial nerve is rarely seen and is usually associated with congenital middle or inner ear anomalies. A unique case of bilateral bifid intratemporal facial nerves without other middle or inner ear abnormalities was encountered incidentally on CT imaging during preparation for unilateral cochlear implant placement in an adult male with profound sensorineural hearing loss. The nerve was bifid along the mastoid segment with a nerve branch traversing through the facial recess precluding safe traditional approach to cochlear implant placement. Accessory stylomastoid foramina were noted bilaterally. Unilateral subtotal petrosectomy was performed with successful implantation and excellent hearing outcome. No additional clinical or radiographic otologic abnormalities were noted. **Conclusions:** Abnormal bifurcation of the facial nerve may occur in adults without other middle or inner ear anomalies. This case highlights the importance of independent imaging review by the surgeon and vigilance to potential rare anatomic aberrations of the facial nerve during cochlear implantation.

228. Impact of COVID-19 on Cholesteatoma Diagnosis and Treatment

Jeremy D. Yang, MD, Aurora, CO; Karuna Dewan, MD, Shreveport, LA; Steven Conrad, MD PhD, Shreveport, LA

Educational Objective: At the conclusion of this presentation, the participants should be able to have a foundational understanding of the impact that the COVID-19 pandemic had on the diagnosis and treatment of cholesteatoma.

Objectives: The purpose of this investigation is to examine the effects that the pandemic may have had on cholesteatoma - specifically severity of disease and delay in diagnosis and treatment - in patients undergoing initial surgical intervention in a tertiary care otology practice. **Study Design:** This study is a retrospective chart review of patients treated for cholesteatoma. Patients who underwent primary surgical management of cholesteatoma between October 2018 and December 2021 were included. **Methods:** Collected data through chart review included time from referral to first otology clinic visit, time to initial diagnosis of cholesteatoma, and time to first surgical intervention for cholesteatoma. The extent of cholesteatoma disease and surgery, hearing loss levels, and need for additional surgical intervention were also considered. The two cohorts were pre-pandemic (October 2018 through February 2020) and post-pandemic (March 2020 through December

2021), and the data sets were compared using the Wilcoxon rank sum test. Results: A total of 86 patients met inclusion criteria, 37 of which were treated pre-pandemic and 49 after March 2020. Of all the examined variables, only time from diagnosis to surgery and case duration were significantly different between the two cohorts, with the pandemic cohort experiencing less time between diagnosis and surgery, as well as shorter case duration. Conclusions: More research will need to be conducted to determine how the pandemic caused these findings. Perhaps the shortened timeframe between diagnosis and surgery and shortened case duration are due to more operating room availability due to fewer elective cases being scheduled.

Pediatric Otolaryngology

229. Head and Neck Manifestations of Pediatric Paraneoplastic Syndromes: A Case Report and Literature Review

Syed O. Ali, BS, Milwaukee, WI; Sophie G. Shay, MD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the head and neck manifestations of paraneoplastic syndromes in pediatric patients.

Objectives: To summarize the head and neck manifestations of pediatric paraneoplastic (PnP) syndromes. Study Design: Case report and literature review. Methods: Literature review of head and neck manifestations of paraneoplastic syndromes in children (age < 18.0). Results: A 3 year old female presented with progressive feeding difficulties, weight loss, and speech changes following tonsillectomy/adenoidectomy. Physical examination demonstrated hypernasal voice and right sided, soft palate weakness. Speech pathology evaluation and flexible laryngoscopy demonstrated velopharyngeal insufficiency and right vocal cord paresis. Neuromuscular workup and MRI of the brain, neck, and chest were unremarkable. She then developed bilateral tongue fasciculations, mild dysarthria, left vocal cord paresis. Subsequent electromyography testing of bilateral laryngeal, soft palate, and tongue showed neurogenic injury to all sites. After developing altered mental status, she was found to have +ANNA-1/Anti-Hu associated encephalitis. Further imaging eventually revealed a retroperitoneal ganglioneuroblastoma. Pediatric PnP syndromes are rare and the incidence is unknown. Head and neck manifestation of PnP syndromes can include sialorrhea, hearing loss, facial dyskinesia, and sleep disturbance. Subcategorizations of pediatric PnP syndromes include: neurological, endocrine, and dermatologic/rheumatologic. Neurological PnP syndromes can affect anywhere on the nervous system axis. Opsoclonus-mycoclonus and paraneoplastic encephalitis are well described neurological PnP syndromes. Endocrine tumors associated with PnP syndromes include carcinoid tumors, neural endocrine tumors, and glucagonomas. Paraneoplastic pemphigus, dermatomyositis, and polymyositis are rheumatologic paraneoplastic syndromes with head and neck manifestations. Conclusions: Prompt recognition of the various disease presentations may expedite diagnosis of underlying malignancy and promote early intervention. Pediatric otolaryngologists should have an awareness of the head and neck manifestations of pediatric paraneoplastic syndromes.

230. Congenital Bifid Tongue and Prominent Ankyloglossia: A Case Report

Jessica Lynn Bertram, BA, Memphis, TN; Meredith Allen, MD, Memphis, TN; Rose Mary S. Stocks, MD PharmD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the pathophysiology behind bifid tongue and tongue tie; 2) be able to recognize congenital bifid tongue and prominent ankyloglossia; and 3) be able to manage prominent ankyloglossia.

Objectives: Describe a case of congenital cleft tongue and prominent ankyloglossia. Study Design: Case report. Methods: Retrospective chart review. Results: We present a 10 day old former 39 week Caucasian female infant referred to the pediatric otolaryngology department for initial evaluation of tongue tie and latching difficulties. The patient's mother reported no complications during pregnancy, birth or NICU stay, but the father reported a history of tongue tie that was surgically corrected. Clinical examination revealed a well nourished, developmentally normal infant with intact soft and hard palate, cleft tongue, prominent ankyloglossia with two thick bands fused at midline and very limited tongue mobility. Due to the thickened and potentially vascular nature of the tongue tie, frenulectomy was performed in the operating room under general anesthesia. High temperature electrocautery was used to excise down through the frenulum with no significant bleeding encountered. Bifid tongue was not surgically corrected at this time. Conclusions: During embryological development, failure of the lateral lingual swellings to merge will result in bifid tongue, while failure of cellular degeneration will result in tongue tie. Both are rare congenital malformations that can cause difficulties with language development. Ankyloglossia typically occurs sporadically, while congenital bifid tongue either presents as a syndrome or with additional orofacial abnormalities such as cleft lip or palate. To the best of our knowledge, this is the first case of non-syndromic bifid tongue occurring in isolation with tongue tie. Furthermore, in tongue ties with concern for difficult division or significant bleeding risk, frenulectomy in the operating room under general anesthesia should be considered.

231. Outcomes of Biodesign Myringoplasty in Pediatric Patients

Malek Hocine Bouzaher, MD, Cleveland, OH; Daniel Hewes, MD, Cleveland, OH; Samantha Anne, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the potential utility and benefits of using Biodesign grafts for myringoplasty in pediatric patients with large or recurrent tympanic membrane perforations with prior failed surgical attempts.

Objectives: In a systematic review of the literature regarding pediatric tympanoplasty, the mean weighted perforation closure rate was 83%. The objective of this study is to evaluate outcomes associated with Biodesign, a synthetic graft, for complex myringoplasty in pediatric patients. Study Design: Retrospective review of a single surgeon's experience utilizing Biodesign for myringoplasty in pediatric patients from 2020 to 2022. Methods: Indications for Biodesign myringoplasty included perforations at or larger than 30% of tympanic membrane and prior surgical failures with remnant perforations. Edges of perforations were rimmed, Surgifoam packing placed, and Biodesign tucked under remnant tympanic membrane. Surgifoam and mupirocin ointment were placed over the graft. Demographic, risk factors, and outcome measures were collected. Results: 21 patients, 4 to 17 years old (mean 11.8 years old) underwent 23 myringoplasties. 6 patients had prior surgical attempts at repair, and 11 patients had perforations encompassing 30% or more of the tympanic membrane. Perforation size ranged from 10% to 50% (mean 29%). Operative time was on average about 33 minutes for a unilateral procedure. The mean pure tone average was 21.3 preoperatively and 15 postoperative-

ly. Overall perforation closure rate was 85.7% and there were no complications. Conclusions: In challenging cases with large or recurrent perforations with prior failed surgical attempts, Biodesign myringoplasty achieved an 85.7% closure rate with an average surgical time of 33 minutes and no complications. Biodesign myringoplasty avoids the risks associated with elevation of the tympanic membrane for tympanoplasty procedures. Careful selection of candidates may allow for high closure rates with low risk using Biodesign myringoplasty.

232. Pedunculated Soft Palate Mass in a Child

Taylor Cave, MD, Phoenix, AZ; Austin Dehart, MD, Phoenix, AZ

Educational Objective: Discuss case presentation and literature review for oropharyngeal and nasopharyngeal choristoma.

Objectives: Present the case of a choristoma originating from the soft palate in a four year old female patient. The soft palate choristoma was excised transorally under endoscopic visualization. In addition to our case, will present information relating to choristoma, including a review of similar cases. Study Design: Case report and literature review. Methods: Literature search and review. OVID database was searched for data terms "head and neck", "oropharyngeal" and "choristoma". 302 search results were returned. The resulting articles were manually reviewed abstracts for relevance, 7 articles met inclusion criteria. In addition to the case presented, we have summarized the findings of 8 individual cases within 5 case report publications. Additionally, we discuss the findings of both prospective and retrospective investigations, determining the prevalence of choristomas in tonsillectomy specimens. Results: Six patients (out of eight) described in the case reports presented with upper respiratory symptoms, one patient presented with symptoms resembling a neck mass, and one patient presented with a palatal lesion. The prospective and retrospective investigations into the prevalence of choristomas in tonsillectomy specimens reported roughly 5.9% and 2.5%, respectively. Conclusions: On review of the existing literature, many cases present with symptoms of upper airway obstruction, though a breadth of presentation exists. In the literature examined, surgical excision was utilized for resection of the masses. Surgical resection was repeatedly reported as an effective treatment.

233. Effect of Dedicated Pediatric Inpatient Tracheostomy Rounds

Jordan Isaac Gewirtz, BS, Columbus, OH; Tran Bourgeois, MPH, Columbus, OH; Natalie Kelly, BS, Columbus, OH; Tendy Chiang, MD, Columbus, OH; Prasanth Pattisapu, MD MPH, Columbus, OH; Amy Manning, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to determine the effect of dedicated rounds with respect to surveillance and access to care for pediatric tracheostomy patients.

Objectives: To determine if multidisciplinary, tracheostomy, joint rounds can improve access to care for a vulnerable and medically complex pediatric patient population. Study Design: Retrospective cohort. Methods: Otolaryngologists conducted dedicated, weekly, inpatient, tracheostomy rounds beginning 12/14/20 at a pediatric tertiary care center. Inpatients less than 2 years of age admitted with an existing tracheostomy a year before and after the start of tracheostomy rounds were identified via chart review. Results: 49 patients met inclusion criteria (26 female, 23 male). 27 patients accounting for 59 hospital admissions were identi-

fied in the year prior to the initiation of tracheostomy rounds. 33 patients accounting for 78 hospital admissions were identified in the first year of tracheostomy rounds. The average age at admission the year before and after the initiation of tracheostomy rounds was 1.10 years and 1.27 years, respectively. The median duration of hospitalization the year before and after the initiation of tracheostomy rounds was 5 days (interquartile range (IQR), 3-9 day) and 4 days (IQR, 3-8 days), respectively. The year before tracheostomy rounds started, 39 admits (66.10%) were discharged without being evaluated by an otolaryngologist, and 20 admits (33.90%) were evaluated by an otolaryngologist before discharge. The year after tracheostomy rounds started, 23 admits (29.49%) were discharged without being evaluated by an otolaryngologist, and 55 admits (70.51%) were evaluated by an otolaryngologist before discharge. Conclusions: Dedicated rounds more than doubled surveillance of tracheostomy dependent patients less than 2 years of age and are associated with shorter hospitalizations. Future studies are underway investigating the outcomes of increased surveillance.

234. **Hearing Outcomes in Children Post COVID-19 Infection**

Raluca Gosman, BS, Durham, NC; Jeffrey Cheng, MD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand why there may be potential for sensorineural hearing loss post SARS-CoV-2 infection in children and that with our limited experience, we were not able to identify this adverse complication.

Objectives: SARS-CoV-2 causes COVID-19 infection and has been demonstrated to bind an ACE receptor in the inner ear. We hypothesize that audiometric changes may occur post COVID-19 infection in children. Study Design: Consecutive case series with chart review. Methods: Children < 18 years old within our medical system who tested positive for SARS-CoV-2 infection between 4/1/2020-2/28/2022 and had audiometric evaluation post infection were included. Demographic information and medical history were collected. Audiometric data in the form of newborn hearing screen (NBHS), auditory brainstem response (ABR), and audiometry were reviewed for changes after COVID-19 infection. Results: In total, 70 patients were identified, 41 females and 29 males. Audiometric data was available for 16 (22.9%), six of whom were neonates when infected with SARS-CoV-2 and passed their NBHS bilaterally. One patient was deceased and had an initial pass, then refer on NBHS bilaterally. Four patients had an ABR post infection (range: 2-19 months), three of which were normal; one patient had prior history of conductive hearing loss (CHL) and craniofacial syndrome. Five patients had audiograms available after COVID-19 infection (within 2-18 months): three were normal, and two showed CHL -- one received myringotomy tubes which resolved the CHL. Conclusions: Most children who test positive for COVID-19 do not seem to be routinely evaluated with audiometric testing, despite the potential pathophysiologic susceptibility. In our limited pediatric cohort, we were not able to identify any sensorineural hearing loss or failed NBHS. The conductive hearing loss identified suggests that like other upper respiratory infections, SARS-CoV-2 may exacerbate middle ear dysfunction.

235. **An Unusual Case of Pediatric Immunoglobulin G4 Related Disease**

LaBryson Greene, BSEd, Macon, GA; Elias Saba, MD, Oakland, CA; Daniel Baiyee, MD, Oakland, CA; Luke Schloegel, MD, Oakland, CA; Alexander Rivero, MD, Oakland, CA

Educational Objective: At the conclusion of this report, the participants should be

aware of the unique disease presentation of Immunoglobulin G4 related disease and how it may present in pediatric patients.

Objectives: To describe a rarely seen case of IgG4 related disease in a pediatric patient based on clinical presentation, imaging (MRI, ultrasound) and histopathology. **Study Design:** Case report. **Methods:** Chart review was performed of a 9 year old female presenting with a subcutaneous mobile nodule in the right submandibular region associated with ipsilateral submandibular swelling and jaw pain. **Results:** Ultrasound and MRI showed cervical lymphadenopathy but were otherwise nondiagnostic. Fine needle aspiration revealed mixed lymphoid cells with rare macrophages suggesting an atypical etiology. Right cervical incisional biopsy was inconclusive, but excisional biopsy of the mass revealed follicular hyperplasia and foci in the germinal centers containing a significant increase of IgG4 positive plasma cells. The patient's serum IgG4 levels were within normal limits. **Conclusions:** The diagnosis of IgG4-RD in this case was made based on clinical presentation, imaging, and lymph node excisional biopsy, despite the fact that the patient did not meet the other standard criteria for IgG4-RD diagnosis. The patient received supportive care due to the focal nature of the disease presentation. This case is being reported to improve the timely recognition and treatment of IgG4-RD in pediatric patients.

236. **Fatigue in Children with Hearing Loss and Obstructive Sleep Apnea**

Rebecca Z. Lin, BA, St. Louis, MO; Amy L. Zhang, BS, St. Louis, MO; Emma K. Landes, BA, St. Louis, MO; Amy E. Ensing, BS, St. Louis, MO; Henok Getahun, BA, St. Louis, MO; Judith E.C. Lieu, MD MSPH, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize that children with hearing loss experience similar fatigue levels as children with obstructive sleep apnea.

Objectives: To investigate the fatigue levels of children with hearing loss (HL) and obstructive sleep apnea (OSA), hypothesizing that the fatigue experienced by children with HL is underrecognized. **Study Design:** Cross-sectional survey. **Methods:** We identified children ages 2-18 with HL or OSA who were patients at a pediatric otolaryngology clinic. Participants were mailed packets or recruited in-person at a pediatric sleep center. Parents completed a demographics survey, Pediatric Quality of Life Inventory Multidimensional Fatigue Scale (PedsQL MFS), Hearing Environments and Reflection on Quality of Life (HEAR-QL), and OSA-18 scale. Children 5 years and older also completed self-report surveys. Participants were compared with literature validated healthy controls in statistical analysis. **Results:** Responses of 50 children with HL and 78 with OSA were analyzed. Children with HL and OSA had higher fatigue than healthy controls in both the PedsQL MFS self (HL: 65.5, OSA: 54.8, controls: 80.5, $p < 0.001$) and parent report (HL: 64.7, OSA: 59.5, controls: 89.6, $p < 0.001$). Children with HL had similar cognitive fatigue as children with OSA (self 60.4 vs. 49.5, $p = 0.061$; parent 56.0 vs. 56.9, $p = 0.848$), though with decreased sleep/rest fatigue (self 67.8 vs. 56.2, $p = 0.012$; parent 69.8 vs. 57.7, $p = 0.002$). Children with HL and OSA also had lower disease related quality of life (QOL) compared to controls in the HEAR-QL and OSA-18, respectively. **Conclusions:** Children with HL and OSA experience significantly higher fatigue and lower QOL compared to healthy controls. Similar cognitive fatigue in both groups suggests fatigue in children with HL may be underrecognized.

237. Beyond Laryngoscopy: Advanced Airway Management in PICUs across the United States

Kevin Liu, BS, Columbus, OH; Abdulrahman Althubaiti, MBBS, Columbus, OH; Prasanth Pattisapu, MD MPH, Columbus, OH; Amy Manning, MD, Columbus, OH; Alexandra Sheldon, BS, Columbus, OH; Tendy Chiang, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the trends and success rates of advanced method endotracheal intubation in the pediatric critical care setting.

Objectives: To describe trends of advanced endotracheal intubation (ETI) techniques in the pediatric critical care setting. Study Design: Multi-institutional retrospective cross-sectional study. Methods: Using the National Emergency Airway Registry for Children (NEAR4KIDS), advanced technique ETI quality improvement data were prospectively collected for ETIs in pediatric intensive care units (PICUs) from April 2018 to September 2021. Those who underwent ETI with only direct laryngoscopy or who underwent exchange of an existing endotracheal tube were excluded. Results: A total of 111 patients underwent advanced technique ETI with a median age of 6 (IQR 0-15) years. Advanced technique ETI was successful on the first attempt in 46.8% of cases, with an overall success rate of 94.6%. 3.6% (n=4) of patients received emergent surgical airway management. The most utilized advanced ETI technique was flexible bronchoscopy (n=43, 38.7%), followed by ETI through LMA (n=19, 17.1%), and rigid telescope assisted ETI (n=5, 4.5%). The first attempt success rate among advanced techniques was 59% for flexible bronchoscopy, 64% for ETI through LMA, and 100% for rigid telescope assisted ETI. The provider discipline ultimately successful in performing advanced technique ETI was most often pediatric critical care medicine (n=40, 38.1%), followed by anesthesiology (n=36, 31.4%), and otolaryngology (n=24, 22.9%). Conclusions: While often indicated in challenging clinical scenarios, advanced ETI techniques are ultimately successful in almost all cases. Advanced technique ETI is a highly multidisciplinary process.

238. Total Anesthesia Time in the Treatment of Pediatric Subglottic Stenosis

Marvin S. Lu, BS, Milwaukee, WI; Logan J. Massman, BS, Milwaukee, WI; Karl W. Doerfer, MD, Milwaukee, WI; Thomas C. Robey, MD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should have a better understanding of the quantity of anesthesia that children are subjected to when their subglottic stenosis (SGS) is treated with endoscopic balloon dilation (EBD) or laryngotracheal reconstruction (LTR).

Objectives: The study aims to uncover the time under anesthesia and the number of anesthesia exposures in children with SGS who were successfully treated with EBD, LTR, or both. Study Design: This was a single institution retrospective review. Methods: Children who were treated for SGS with LTR, EBD, or both between November 2014 through August 2020 were included. Only patients who had completed their treatment course, which we defined as not having any airway procedure for a 12 month period, were included. All procedures important to the overall management of SGS, including surveillance procedures, were included.

Results: 31 children met inclusion criteria. Mean age at first procedure was 3.1 +/- 5.4 years. Children who had an LTR (n=13) had 17.1 +/- 7.9 hours of anesthesia and 11.1 +/- 4.9 procedures associated with their treatment course. Of these 13, those who never underwent EBD (n=2) had 10.6 and 10.7 hours of anesthesia. Children treated with EBD alone (n=18) had 6.2 +/- 3.0 hours of anesthesia and 5.9 +/- 3.5 procedures during their treatment course. Those who had an LTR had a longer treatment course (3.1 +/- 1.6 vs 1.3 +/- 1.5 years). Conclusions: Pediatric patients successfully treated for SGS with EBD underwent fewer number of procedures, endured less time under anesthesia, and had a shorter treatment course compared to patients treated with LTR. Patients with higher grade stenosis were more likely to be treated with LTR.

239. Characteristics and Outcomes of Pediatric Vocal Cord Paralysis and Tracheostomy Placement over 10 Years

Gustavo Andres Marino, BA, Orlando, FL; Jihoon Lim, BS, Orlando, FL; Timothy M. Maul, PhD, Orlando, FL; Julie L. Wei, MD, Orlando, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand various demographics, characteristics, etiologies, comorbidities, that influence children with VCP and identify significant associations for dysphagia, tracheostomy placement, and outcomes.

Objectives: Review demographics, characteristics, etiologies, comorbidities, and followup of children with VCP and identify significant associations for dysphagia, tracheostomy placement, and outcomes. Study Design: Retrospective summary. Methods: Retrospective summary of VCP patients (0-18 years) seen by pediatric otolaryngologists at a single tertiary children's hospital from January 1, 2013, to March 31, 2021. Demographics, clinical history, laterality, swallow evaluations, and outcomes were reviewed. Data was analyzed using chi squared and Mann-Whitney U test. Results: Median age at diagnosis of VCP for 172 children was 11 months (2 - 89), 56% male, and 57% Hispanic. More commonly iatrogenic (57%) followed by congenital (26%). Median followup was 20.5 mos (6 - 40.7). Premature birth was identified in 52% with median gestational age of 27 weeks (25 - 35). Only 55% presented with noisy breathing. Left unilateral VCP was most prevalent (52%) and associated with history of cardiac procedure ($p < .001$) and hoarseness ($p = .002$). Bilateral VCP (38.1%) were more likely not associated with history of cardiac procedure(s) ($p < .001$) nor hoarseness ($p < .001$). BVCP was associated with need for tracheostomy ($p < .001$). Of the 60% with concomitant dysphagia, both unilateral LVCP and BVCP were identified, but not with RVCP ($p = .01$). Overall, 50% of patients had clinical improvement over time. Unresolved VCP were associated for those without history of cardiac procedures ($p = .005$) and later age at diagnosis (83 months; $p = .005$). Conclusions: Half of all children with VCP had clinical improvement about 40 months after diagnosis, with positive association over continued followup. LVCP is most common and associated with cardiac procedures. BVCP are most likely to require tracheostomy. Dysphagia was highly common in LVCP and BVCP, but not RVCP.

240. Demographic and Grading Prognostic Factors in Subglottic Stenosis

Logan J. Massman, BS, Milwaukee, WI; Marvin S. Lu, BS, Milwaukee, WI; Karl W. Doerfer, MD, Milwaukee, WI; Thomas C. Robey, MD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how demographic factors and disease severity predict anesthesia exposure and duration of treatment for subglottic stenosis.

Objectives: To determine how demographic factors and subglottic stenosis grade can be used to prognosticate anticipated anesthesia exposure and duration of treatment. **Study Design:** Retrospective review. **Methods:** Children treated for SGS with LTR, EBD, or both between November 2014 through August 2020 were included. Only patients completing their treatment course, defined as no airway procedure in a 12 month period, were included. All procedures and associated anesthesia time for the management and surveillance of SGS were included. **Results:** Thirty-one patients met inclusion criteria. Patient gender did not influence total anesthesia time, number of procedures, or length of treatment course. Controlling for grade of stenosis, older children had fewer procedures ($\beta = -0.34$, $p = 0.036$). Patient age did not correlate with anesthesia exposure ($\beta = -0.42$, $p = 0.100$) nor duration of treatment course ($\beta = -0.10$, $p = 0.101$). Median total anesthesia time increased with grade of stenosis (grade I: 4.61 hours, grade II: 7.32, grade III: 11.03). The median total number of procedures was greater in higher grade stenosis compared to grade I stenosis (grade I: 5 procedures, grade II: 7, grade III: 7). Median duration of treatment was similar among patients with grade I and grade II stenosis but was increased in grade III stenosis (grade I: 0.81 years, grade II: 0.92, grade III: 1.78). **Conclusions:** We found older patient age at initial treatment predicted fewer procedures, and higher grade stenosis predicted increased total anesthesia time, number of procedures, and duration of treatment.

241. Foregut Duplication Cyst of the Floor of Mouth: A Rare and Challenging Congenital Lesion

Jeffrey S. Mella, MD, Charlottesville, VA; William Brand, MD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the differential diagnosis for congenital oral cavity lesions and understand the embryologic origins of a foregut duplication cyst.

Objectives: This case report presents a rare etiology of a congenital oral cavity lesion and highlights the complicated workup and management that similar lesions require. **Study Design:** Case report. **Methods:** A cystic mass of the oral tongue/floor of mouth was first discovered on routine prenatal ultrasound. The patient was born at 38 weeks gestation via EXIT procedure at which time the obstructive floor of mouth cyst was needle decompressed and the patient was intubated for airway protection. A MRI neck revealed a cystic and peripherally enhancing 2x2cm lesion in the left sublingual space suspicious for a ranula vs. lymphatic malformation. After multiple needle decompressions, the cystic lesion again reaccumulated causing significant airway obstruction and necessitating definitive surgical management. **Results:** The patient underwent surgical excision at 4 weeks of life. The lesion was noted to be arising from the lateral surface of the tongue, involving the tongue musculature without significant extension through the floor of mouth. A thick capsule was appreciated around the cyst. Frozen tissue biopsy of the lesion revealed gastric mucosa consistent with a foregut duplication cyst which was confirmed by permanent pathologic analysis. The patient recovered well and was seen at 1 year followup with no concern for recurrence. **Conclusions:** Oral cavity foregut duplication cysts are a very rare entity with less than 60 cases reported in the literature. As in the case presented, workup and management of congenital

oral cavity lesions is complicated by their immediate impact on the airway. Surgical excision is often required with low rates of documented recurrence.

242. The Association between Socioeconomic Disadvantage with Decannulation, Mortality, and Severe Neurocognitive Disability among Pediatric Tracheostomy Patients

Dalia Mitchell, BA, Dallas, TX; Romaine F. Johnson, MD MPH, Dallas, TX (Presenter); Stephen R. Chorney, MD MPH, Dallas, TX; Yann-Fuu Kou, MD, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of social advantage and long term tracheostomy outcomes.

Objectives: This study assessed whether there is an association between socioeconomic disadvantage and time to decannulation, mortality, and presence of severe neurocognitive disability among pediatric tracheostomy patients. Study Design: Prospective cohort study. Methods: This prospective cohort study of children with tracheostomy followed patients until decannulation, death, or aging out at 21. Patients were grouped into low and high disadvantaged groups using the Area Deprivation Index (ADI), a validated measure of socioeconomic status and whether they had severe cognitive disabilities. Survival and logistic regression analyses were used to determine the primary outcomes' relationships to socioeconomic status and neurocognitive disabilities. Results: N=554 children underwent tracheostomy from 2015-2020. The median (IQR) age was 7.2 (3.8-49) months with 308 (56%) males. 308 (56%) were White, and 154 (28%) were Black. The most frequent indication was respiratory failure (N=329, 60%). 388 (70%) lived in more disadvantaged communities, while N=291 (53%) were considered severely neurocognitive disabled. The ADI was not associated with decannulation, mortality, or the presence of severe neurocognitive disability (all $P > .05$). Severe neurocognitive disability was significantly associated with decreased decannulations (HR = 0.21, 95% CI = 0.14 - 0.30, $P < .001$) but not mortality (HR = 1.38, 95% CI = 0.94 - 2.05, $P = .10$). Conclusions: Socioeconomic status was not associated with decannulation, mortality, or neurocognitive disability. Severe neurocognitive disability was associated with lower decannulation rates but not mortality risk. These findings provide further evidence that the underlying disorders for tracheostomy placement are the most critical factor in determining long term outcomes.

243. Videofluoroscopic Swallow Study Outcomes after Pediatric Type 1 Laryngeal Cleft Repair

Dalia Mitchell, BA, Dallas, TX; Romaine F. Johnson, MD MPH, Dallas, TX (Presenter); Palmila Liu, MD, Dallas, TX; Yann-Fuu Kou, MD, Dallas, TX; Seckin Ulualp, MD, Dallas, TX; Stephen R. Chorney, MD MPH, Dallas, TX

Educational Objective: The educational objective of this series is to recognize the utility of instrumental swallowing assessments after pediatric type 1 laryngeal cleft repair and to understand rates of dysphagia improvement based on technique.

Objectives: The primary objective was to compare injection laryngoplasty (IL) and endoscopic repair (ER) on videofluoroscopic swallow study (VFSS) outcomes after pediatric type 1 laryngeal cleft repair. Study Design: Case series with chart review.

Methods: All children (<18 years) with a type 1 laryngeal cleft that underwent IL or ER between 2017 and 2021 at a tertiary children's hospital were reviewed. Those obtaining preoperative and postoperative VFSS met inclusion. Outcomes captured rates of improvement for thin liquid dysphagia, dysphagia severity, thickened consistencies, and functional oral intake scale (FOIS). Results: There were 108 children that met inclusion with 55 obtaining an IL (51%) and 53 obtaining an ER (49%) as an initial intervention. Children were 2.8 (SD: 2.1) vs. 3.7 (SD: 3.7) years at surgery (P=.14), respectively. Improvement in rates of thin aspiration (31% vs. 23%, P=.39), thin penetration (11% vs. 13%, P=.78), pharyngeal dysphagia severity (44% vs. 48%, P=.70), and FOIS scores (42% vs. 37%, P=.69) were no different between techniques. Reduction in thickened consistencies were also similar (45% vs. 38%, P=.43). An ER was performed in 23 children (42%) at a median of 10.5 months (IQR: 4.4-15.6) after initial IL. Among this group, improvement in aspiration (18%), penetration (27%), pharyngeal severity (45%), FOIS score (27%), and thickener consistency (32%) remained low. VFSS outcomes were unimpacted by age, comorbidities, and severity of pharyngeal dysphagia. Conclusions: Regardless of technique, objective assessments of swallowing identify frequent dysphagia persistence after pediatric type 1 laryngeal cleft repair. The emphasis on VFSS results after these procedures should be tempered and future exploration is warranted for the role of these instrumental assessments postoperatively.

244. **Transcervical Approach to Decompressing a Posterior Pneumomediastinum in a Premature Infant**

Karolina Agata Plonowska-Hirschfeld, MD, San Francisco, CA; Shaini Shiva, BS, Sydney, Australia; Garani Nadaraja, MD, San Francisco, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe etiology and management strategy in neonatal posterior pneumomediastinum resultant from pulmonary interstitial emphysema (PIE).

Objectives: To present a unique case of neonatal posterior pneumomediastinum resulting from pulmonary interstitial emphysema (PIE) managed with transcervical drain placement. Study Design: Case report. Methods: Clinical course and intraoperative findings were abstracted from the electronic medical record. Literature review of PIE and neonatal pneumomediastinum in preterm infants was performed. Results: A 14 day old ex-28 week infant with respiratory distress on RAM canula was found to have progressively enlarging posterior pneumomediastinum from PIE. He developed tension physiology due to compression of the left atrium by the loculated air as well as progressive cervical subcutaneous emphysema. Due to concern for hemodynamic instability and possible airway obstruction from submucosal emphysema in the upper airway, the patient underwent a transcervical anterior mediastinal drain placement. The infant was kept spontaneously breathing on RAM cannula with procedural sedation with ketamine. A small, low transverse cervical incision allowed visualization of the pleura and anterior mediastinum, and a silicone 0.25 inch Penrose drain was placed. Postoperatively, the infant had improved work of breathing and resolution of his neck subcutaneous emphysema. Daily chest X-rays showed progressive decrease in the loculated posterior pneumomediastinum volume and reexpansion of compressed lung parenchyma. By postoperative day 10, the pneumomediastinum had resolved and the drain was discontinued. Conclusions: Given potential life threatening sequelae for neonates with PIE related pneumomediastinum, urgent procedural intervention may be required. This is the first reported case of transcervical decompression of neonatal pneumomediastinum in the setting of PIE, an alternative surgical approach to a

thoracotomy in the select patient.

245. A Clinical Analysis of Pediatric Clival Chordoma Management and Outcomes

Catherine C. Russo, BS, Columbus, OH; Aaron Craft, BS, Columbus, OH; Annie Drapeau, MD, Columbus, OH; Aaron McAllister, MD, Columbus, OH; Tandy Chiang, MD, Columbus, OH; Patrick Walz, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the clinical manifestations of pediatric clival chordoma.

Objectives: To analyze the clinical management and related outcomes of conventional chordoma and poorly differentiated chordoma in the pediatric population. Study Design: Single institution retrospective case series. Methods: After IRB approval, patients diagnosed with chordoma of the clivus between 2015-2020 were identified and reviewed. Clinical characteristics including histological classification, number of surgeries, extent of surgical resection, radiation therapy, adjuvant therapy, and long term outcome were analyzed. Results: Seven pediatric patients with clival chordoma met inclusion criteria. Conventional chordoma and poorly differentiated chordoma was diagnosed in four (57%) and three (43%) patients, respectively. All patients underwent resection surgery, 6 with (85.7%) curative intent and one (14.3%) for symptom palliation. Two patients with (50%) conventional chordoma and two with (67%) poorly differentiated chordoma cases achieved gross total resection. Three cases (43%) were treated with chemotherapy, two (67%) poorly differentiated and one (25%) conventional chordoma. Local recurrence occurred in one patient with conventional chordoma (25%) 29 months after resection; one (25%) patient with conventional chordoma recurred with distant metastatic disease 6 months after diagnosis. Two (50%) cases of conventional chordoma and one (33%) case of poorly differentiated chordoma resulted in disease related patient mortality ranging 4 to 58 months after diagnosis. Surviving patients have followup ranging from 15 to 60 months. Conclusions: Clival chordoma remains an aggressive and challenging disease entity and requires aggressive management with multidisciplinary care aimed at gross total resection and adjuvant therapy to achieve long term survival.

246. Diagnostic Utility in the Workup of Pediatric Nontuberculous Mycobacterial Cervicofacial Lymphadenitis: A Systematic Review

Elias S. Saba, MD, Oakland, CA; Ghedak Nather Ansari, MD, Oakland, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the types of diagnostic methods used to workup patients with suspected nontuberculous mycobacterial (NTM) cervicofacial lymphadenitis and understand the sensitivity, specificity, benefits and disadvantages of each type of test.

Objectives: To determine the sensitivity and specificity of various diagnostic criteria used in the workup of pediatric patients with suspected NTM cervicofacial lymphadenitis. Study Design: Systematic review. Methods: A systematic review in accordance with Preferred Reporting Items for Systematic reviews and Meta-Anal-

yses (PRISMA) guidelines was performed using the PubMed, EMBASE, and Web of Science databases. Standardized bias assessment was performed. Results: Of 836 abstracts/articles reviewed, 20 studies were included incorporating 16 retrospective and 4 prospective observational studies. 8 articles reported on PPD testing, 4 on IFN gamma assay, 4 on imaging techniques, 3 on PCR, and 2 on culture techniques. No single laboratory study obtained prior to culture/tissue data offered sufficient sensitivity/specificity for definitive diagnosis. Common ultrasound findings distinguishing NTM from other causes of lymphadenopathy included hypoechogenicity and intranodal cystic necrosis. Several studies investigated differentiation of NTM from mycobacterium tuberculosis (MTB) lymphadenitis. IGRA testing had exceptionally low rates in NTM patients (3.1-8%), offering a possible means for differentiation. TST positivity rate widely ranged across studies. Level of evidence ranged from 2-4 and all studies had an overall low risk of bias. Conclusions: A gold standard for the diagnosis of NTM cervicofacial lymphadenitis prior to intraoperative culture does not currently exist. A lack of an ideal diagnostic standard may lead to late diagnosis which can be associated with higher risk of iatrogenic facial nerve injury and poor aesthetic outcomes. A variety of different diagnostic methods exist for the diagnosis of NTM cervicofacial lymphadenitis and should be considered to avoid complications and delayed diagnosis.

247. Comparing Recurrence Rates between Cautery Techniques for Recurrent Epistaxis in Children

Austin D. Schafer, BA, Columbus, OH; Megan McNutt, BS, Columbus, OH; Amy Fulmer, BS, Columbus, OH; Tran Bourgeois, MPH, Columbus, OH; Charles A. Elmarqah, MD FACS FAAP, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to explain how recurrence rates differ between cautery techniques for recurrent epistaxis.

Objectives: To compare the recurrence rate of epistaxis between children treated with silver nitrate (SN) in the office or electrocautery in the operating room (OR). Study Design: Retrospective cohort study. Methods: Patients aged 2 - 17 diagnosed with epistaxis (ICD R04.0) in 2018 and treated with SN or electrocautery were retrospectively reviewed. Epistaxis laterality, history of nasal trauma, and personal or family history of a bleeding disorder were recorded. Patients with prior cautery or epistaxis secondary to a procedure were excluded. Recurrence was defined as initial encounter after cautery with documented epistaxis. Time to recurrence between SN and electrocautery was compared with hazard functions with predictors for recurrence analyzed via Cox's proportional hazard regression. Results: Among 280 patients cauterized for epistaxis, 61% (n = 170) received SN compared to 39% (n = 110) who underwent electrocautery. Risk of recurrence was significantly higher among those treated with SN (48% vs. 26% (electrocautery), P = 0.0003). Median time to recurrence was 40.17 months (IQR 6.31, 44.65) for SN vs. 41.89 months (IQR: 38.21, 46.16) for electrocautery (hazard ratio 0.48 (95% CI: 0.31 - 0.73)), P = 0.0004 (log rank test). Complication rates were low for both groups (1.25% (SN) vs. 0% (electrocautery), P greater than 0.05). Conclusions: Among patients with epistaxis, risk of recurrence is significantly higher in those cauterized with SN compared to electrocautery. Complications for both methods are low.

248. Surgical and Medical Management of Chronic Rhinosinusitis in Pediatric Cystic Fibrosis Patients: Impact on Olfactory Symptoms

Holly D. Shan, BS, New York, NY; Brandon J. Vilarello, BA, New York, NY; Patricia T. Jacobson, BSN, New York, NY; Jeremy P. Tervo, BS, New York, NY; David A. Gudis, MD, New York, NY; Jonathan B. Overdevest, MD PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should understand that a systematic review of the literature suggests endoscopic sinus surgery and dornase alfa may improve olfaction in pediatric cystic fibrosis patients. Sample sizes, however, are small and studies lack formal psychophysical measures of olfaction. Moving forward, the importance of smell in quality of life warrants the inclusion of olfactory outcomes as part of comprehensive outcomes assessment in pediatric CF patients.

Objectives: Olfactory dysfunction (OD) commonly occurs in patients with sinonasal dysfunction, but the prevalence and severity of olfactory issues in adolescents with cystic fibrosis (AwCF) is unclear. OD may contribute to dietary deficiencies and exacerbate nutritional challenges. We sought to systematically review literature on the effectiveness of medical and surgical management of sinonasal symptoms in AwCF and the associated impact on olfactory function. **Study Design:** Systematic review. **Methods:** We performed a literature search of PubMed, Embase, Web of Science, and Ebsco CINAHL from 1980 to 2022 to compile data on study design, patient demographics, clinical characteristics and outcomes, along with risk of bias. **Results:** Of 368 abstracts, 4 articles exclusively evaluated AwCF for a total of 44 patients. Two studies evaluated functional endoscopic sinus surgery (FESS), and one each for dornase alfa and elexacaftor tezacaftor ivacaftor (ETI). Outcome measures included subjective assessment of OD using non-validated (1/4) and validated (2/4) surveys, and semi-objective (1/4) smell testing. Studies evaluating FESS and dornase alfa reported statistically significant improvement in OD, whereas ETI failed to improve OD despite improvement in other quality of life measures. These findings were replicated in 6 articles that included populations of adults and AwCF, totaling 293 patients: FESS and dornase alpha improved OD, while ETI did not. **Conclusions:** There is limited data regarding the impact of medical and surgical interventions on olfaction outcomes for AwCF. Assessment of olfaction was limited to subjective and qualitative self-report. We suggest that semi-objective tracking of olfactory outcomes is critical in this population with dietary challenges and weight management issues.

249. Tympanostomy Tube Removal at 2.5 Years: Fewer Surgeries, Fewer Risks

Noah Jonathan Thornton, BS, Philadelphia, PA; Glenn Isaacson, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to explore the long term results of a protocol delaying tympanostomy tube (TT) removal until 2.5 years after placement in terms of surgeries required, permanent perforation rates and need for tympanic reintubation.

Objectives: In 2001, we instituted a protocol for removal of retained tympanostomy tubes (TT), delaying elective removal until 2.5 years after placement. It was hoped that this would decrease the number of surgeries without increasing the rate of permanent tympanic perforations. **Study Design:** Computerized review of prospectively accrued data. **Methods:** Protocol: Fluoroplastic Armstrong grommet TT were placed by a single surgeon. Children with TT were seen at 6 month in-

tervals after TT placement until both tubes had extruded and disease resolved. Children with a retained TT in one or both ears at 2 years were seen again at 2.5 years and retained tubes removed under general anesthesia with patch application. All were examined at 4 weeks after surgery. Those with recurrent disease or persistent perforations were followed. Study: A computerized collection of patient letters and operative reports was queried to identify children treated according to the protocol between 2001-2021. Those with examinations at 24 months +/- 1 month and 30 months +/- 1 month and complete followup were included. Number of children requiring surgical tube removal, persistent perforations, and reintubations were recorded. Results: Of 10,000 children with TT, 497 underwent tube removal (538/20,000, 2.69% per ear). 147 fit strict inclusion criteria. Among those with retained tubes at 24 months, 95/147 (64.6%) had lost one or both tubes by 30 months. 80/147 (54.4%) required unilateral or bilateral tube removal. 9/147 (6.1%) had persistent perforations 1 year postop. 4 of the 147 required tympanic reintubation. Conclusions: Delaying TT removal until 2.5 years markedly decreased the need for surgery without increasing permanent perforations compared to historical controls.

250. Most Pediatric Hospital Websites Show Poor Otoscopy Techniques

Norman Wendell Todd Jr., MD MPH, Atlanta, GA; Alexa Murzyn Todd, AuD, Marietta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to know that images of otoscopy in the websites of pediatric hospitals do not depict safe technique, specifically stabilization of the otoscope against the patient's head.

Objectives: We sought to determine whether pediatric hospital websites show proper otoscopy techniques - our thinking being that families and trainees may be influenced to think that poor techniques are acceptable. Would you happily ride an airline whose advertisement showed an aircrew member doing something less than safe? Study Design: Cross-sectional. Methods: Review of the websites of the 223 United States hospitals listed as members of the Children's Hospital Association, which describes itself as "the voice of children's hospitals nationally". Results: In 2022, of the 32 websites showing otoscopy, only 3 (10%) showed otoscope stabilization against the head. Conclusions: Safe techniques of otoscopy are shown at a minority of websites of children's hospitals in the United States.

251. Cleft Lip/Palate Repair Outcomes in Children with Mental Health Disorders

Sudeepti Vedula, BS, Newark, NJ; Evelyne Kalyoussef, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the association between mental health diagnoses and outcomes following cleft lip/palate repair surgery.

Objectives: To understand the effect of mental health disorders on outcomes in patients undergoing repair of cleft lip and/or palate. Study Design: Retrospective cohort study. Methods: The Kids' Inpatient Database (KID) 2003-2019 was queried for patients undergoing repair with a cleft lip and/or palate with a concomitant diagnosis of cleft lip and/or palate. Patients were stratified into two groups based on presence of comorbid mental health diagnosis. Univariate and multivariate analyses were performed to compare demographics and outcomes between the

two groups. Results: A total of 33,340 cases of cleft lip and/or palate repair were identified. Of these, 1348 (4.0%) patients had a mental health diagnosis. The patients with a mental health diagnosis tended to be between 1 to 3 years old, Caucasian, with no gender predilection. When accounting for demographics and comorbidities such as asthma and obstructive sleep apnea, patients with psychiatric diagnoses were more likely to have major respiratory complications (OR = 4.207 [1.651,10.721], $P = 0.003$) on both univariate and multivariate analyses. Patients with mental health disorders also had a significantly longer length of stay (1.90 +/- 0.027 vs 2.62 +/- 0.207, $P < 0.001$), and increased hospital charges (\$22,089.09 +/- \$240.09 vs \$40,505.59 +/- \$3869.96, $P < 0.001$). Conclusions: In this nationally representative sample, children with a mental health diagnosis undergoing repair of cleft lip and/or palate are at a greater risk for postoperative complications with longer lengths of stay and increased hospital charges. These patients have an elevated risk of major respiratory complications with not increased risk of adverse cardiac outcomes.

252. **Role of Neuropsychiatric Comorbidities in Pediatric Cochlear Implantation Outcomes**

Sudeepti Vedula, BS, Newark, NJ; Aparna Govindan, MD, New York, NY; Evelyne Kalyoussef, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the association between neuropsychiatric comorbidities and outcomes in patients receiving pediatric cochlear implantation.

Objectives: To understand the association between mental health disorders and hospital outcomes in patients undergoing placement of a cochlear implant. Study Design: Retrospective cohort study. Methods: The Kids' Inpatient Database (KID) was queried for patients undergoing cochlear implantation between 2003-2019. Patients were stratified into two cohorts: those with and without comorbid neuropsychiatric conditions. Univariate and multivariate analyses were performed to compare demographics and outcomes. Results: A total of 1387 cases were identified. Of these, 168 (12.1%) patients had a neuropsychiatric diagnosis. Most patients in the cohort were 1 to 5 years old (62.1%) and Caucasian (54.9%). The cohort was 51.3% male and 49.7% female ($P=0.890$). On univariate analysis, major respiratory complication was the only postoperative complication with a significantly increased incidence in patients with mental health diagnoses (1.7% vs 0.4%, $P = 0.05$). However, after accounting for demographics and comorbidities including asthma and obesity, there was no significant difference in major respiratory complications between the two groups (OR = 3.610 [0.742,18.548], $P = 0.110$.) Additionally, patients did not have significantly different lengths of stay (2.02 vs 1.51, $P = 0.131$) or hospital charges (\$95,933.70 vs \$112,220.96, $p = 0.617$). Conclusions: Cochlear implantation in children with significant hearing loss can powerfully impact speech, language and psychosocial development. In this retrospective cohort analysis we found no significant differences in postoperative complication, length of stay or hospital charges between those with and without comorbid mental health disorders. These findings can offer reassurance to and alleviate concerns of parents of children with mental health diagnoses when preparing for surgery.

253. **Update on Transoral Robotic Surgery (TORS) for Upper Airway Pathology in the Pediatric Population**

Cameron P. Worden, MD, Chapel Hill, NC; Andrew C. Prince, MD, Chapel Hill, NC; Sam N. Kirse, BS, Chapel Hill, NC; Adam M. Zanation,

MD, Hickory, NC; Carlton J. Zdanski, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to compare TORS versus traditional approaches to the treatment of upper airway pathology in the pediatric population.

Objectives: To report a 5 year update to our institution's experience with transoral robotic surgery (TORS) for upper airway pathology in the pediatric population. **Study Design:** A retrospective case series at a tertiary care academic institution from 2010 to 2022. **Methods:** The da Vinci Robot (Intuitive Surgical, Inc., Sunnyvale, Ca) utilizing a two surgeon approach was used for all TORS cases. Patients with similar matched pathology undergoing a traditional open or endoscopic approach were used as controls for comparison. **Results:** Forty children (19M, 21F) underwent 46 TORS procedures. Procedures included: laryngeal cleft repair (n=18), resection of lymphatic malformation (n=13), base of tongue mass (n=7), saccular cyst (n=4), laryngotracheoplasty with posterior cartilage graft (n=2), and release of pharyngeal or esophageal stricture (n=2). Age range of patients was 12 days to 17 years. All cases had successful robotic access and there were no intra-operative complications. Mean operative time for robotic type 1 cleft repairs was 149 minutes vs 111 for matched controls (p=0.05). There were no significant differences in mean operative time, operating room setup time, or EBL between other TORS procedures and matched controls. Mean postoperative hospital course was generally comparable between groups, except for type 2 cleft repairs which was 4 days for TORS cases vs 13.5 days for matched controls (p<0.05). Postoperative complication rate was 15% for TORS cases vs 18% for matched controls. **Conclusions:** This study represents the largest case series reporting the utilization of TORS for upper airway pathology in the pediatric population. We show that implementing TORS in the appropriate pediatric patient is safe and comparable to traditional approaches.

254. **Epistaxis Is much more Common in School Age Children**

Flora Yan, MD, Philadelphia, PA; Hetvi Patel, BA, Philadelphia, PA; Glenn Isaacson, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate variations in the frequency of epistaxis in children of different ages.

Objectives: Epistaxis seems to be rare in very young children and more common in the late first decade. We sought to confirm or refute this clinical impression using a representative national outpatient database. **Study Design:** A cross-sectional analysis of data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) from the years 2007-2011 was performed. **Methods:** The NHAMCS is a CDC curated national sample of data from visits to non-federally employed office based physicians and health centers. We queried the NHAMCS to determine the cumulative incidence of epistaxis in children of different age groups. Cases of epistaxis was defined by ICD-9 code 784.7, given data was obtained prior to initiation of ICD-10. Comparison of rates was performed using the chi squared test. A p value less than 0.05 was considered statistically significant. **Results:** In total, 55,435,691 children (27,816,237 [50.2%] male, 55,435,691 [77.2] white) were included. The overall cumulative incidence rate was 2.4/1000 children. Children in the 5-8 year range had the highest cumulative incidence of epistaxis (4.8/1000), followed by those in the 0-4 (2.3/1000), 9-12 (2.1/1000), and 13-17 (0.8/1000)

year ranges (p less than 0.001). Conclusions: Pediatric epistaxis is common in the office setting (2.4 per 1000 children) -- well about estimates in the emergency room setting (1.7 per 1000 people). Children between the ages of 5-8 years have the highest cumulative incidence of epistaxis. We discuss possible causes of more frequent epistaxis in the population.